REPORT RESUMES

ED 017 044 24 EA 001 026

EDUCATION THROUGH VISION. FINAL REPORT.

BY- HAYES, BARTLETT H., JR.

HARVARD UNIV., CAMBRIDGE, MASS.

REPORT NUMBER CRP-3085 PUB DATE SEP 67

REPORT NUMBER BR-5-1188

CONTRACT OEC-5-10-323

EDRS PRICE MF-$0.50 HC-$4.08 100P.

DESCRIPTORS- EDUCATIONAL RESEARCH, *TEACHER EDUCATION, *HIGH SCHOOL CURRICULUM, CURRICULUM DEVELOPMENT, VISUAL ARTS, *VISUAL PERCEPTION, PHOTOGRAPHY, STUDENT BEHAVIOR, TEACHER BEHAVIOR, SUMMER PROGRAMS, FILMSTRIPS, *VISUAL LEARNING, CREATIVITY, *INTERDISCIPLINARY APPROACH, CAMBRIDGE,

THIS PROJECT IS CONCERNED WITH IMPROVEMENT OF THE NORMAL HIGH SCHOOL CURRICULUM WHICH IS VIRTUALLY LIMITED TO VERBAL AND FACTUAL SYSTEMS OF LEARNING. IT IS HYPOTHESIZED THAT VISUAL LEARNING CAN PROVIDE PERSONAL INVOLVEMENT AND DEEP CONSEQUENT MOTIVATION. TEAMS OF TEACHERS FROM SPECIALLY INVITED PUBLIC SCHOOLS PARTICIPATED IN TWO AND THREE DIMENSION EXPERIENCES AND IN PHOTOGRAPHY. A PRINCIPAL OBJECTIVE OF THE STUDY WAS TO SEE HOW ADULTS WITH LITTLE OR NO VISUAL TRAINING REACT AND HOW TEACHERS SO TRAINED UTILIZE THIS EXPERIENCE IN THEIR OWN TEACHING. (HM)

DOCUMENT FILMED FROM BEST AVAILABLE COPY

5-1188
24

ED017044

FINAL REPORT

Project No. 3085

Contract No. OE-5-10-323

EDUCATION THROUGH VISION

September 1967

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
Bureau of Research

EA C01 C26

EDUCATION THROUGH VISION

Project No. 3085
Contract No. OE-5-10-323

Bartlett H. Hayes, Jr.

September 1967

The research reported herein was performed pursuant to a contract with the Office of Education, U. S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

Graduate School of Education
Harvard University
Cambridge, Massachusetts

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Research Program
in
EDUCATION THROUGH VISION

Contents

INTRODUCTION I

METHOD IV

DISCUSSION V

CONCLUSIONS VI

SUMMARY VII

APPENDIX A 2

APPENDIX B 52

INTRODUCTION

Problem

The problem is how to improve the normal high school curriculum which is virtually limited to verbal and factual system of learning. The hypothesis is that visual learning can provide personal involvement and develop consequent motivations not currently utilized.

Origin of the Program

The Research Program in Visual Perception, initiated jointly under the auspices of the Council for Public Schools and the Massachusetts College of Art (a division of the Department of Education of the Commonwealth of Massachusetts) was organized at Phillips Academy, Andover, in the summer of 1963, supported by the Robert Sterling Clark Foundation, the Ford Foundation, and the American Council of Learned Societies. Its purpose was to examine the attitudes of high school teachers representing different disciplines toward visual experiences not only with respect to the broadened humanistic horizons evoked by the exercises themselves, but also with respect to any purposeful implelentation of the learning process in those various disciplines (History, Science, Language, etc.) which the visual experience might promote. This report is concerned with the continuation of the Research Program, currently known as Education Through Vision, particularly with that portion of the research which has been partially supported by Federal funds (from May 1st, 1965 to September 30, 1966). Two other reports have previously been issued: the Interim Report, June, 1965, and the Conference Report, February, 1966.

Review of Related Research

There are a number of programs both operating and proposed, which, on first glance, seem to be somewhat similar to the present one --- such as that under the direction of Leon Karel at Kirksville State College, Missouri, being conducted in selected schools throughout the state; or the scholars' program conducted by Oliver Winsand at the Carnegie Institute of Technology for certain Pittsburgh public schools; or Donald Brigham's kindergarten through twelfth grade sequential program in Attleboro, Massachusetts. Plans for expanded art curricula in Jacksonville, Florida, Tempe, Arizona, and New York City (to cite three more from an increasing volume of school plans) are also representative. The school-museum program of Dayton, Ohio, the museum-school program of Portland, Oregon and that of the school department of Brookline, Massachusetts, working in conjunction with the Museum of Fine Arts, Boston, presume a certain amount of community-institutional collaboration, whereas Connecticut's program CREATE operating in six rural and urban communities comes under the sponsorship of the State Commission of Fine Arts. The foregoing are all specifically concerned with art, which is but one aspect of the present research. Others such as the photographic experiment financed by the Ford Foundation collaborating with Eastman Kodak Company in Bellingham, Washington, or the Canadian Broadcasting Corporation curriculum research under the guidance of F. B. Rainsberry, have more to do with education which utilizes new visual communication media, another aspect of the present research. Related, too, but not closely, are a number of new curricula in the broad field of humanities most of which provide no more than a simultaneous loosely connected experience in literature, history and one or more of the arts. Most of these programs attempt to link what is already taught separately rather than construct a new interrelationship with fresh material. However, one research group funded by the E. E. Ford Foundation, has been at work for two years under the guidance of Allan Hoey, instructor in Classics at the Hotchkiss School. The members of his committee have been drawn from both public and independent schools and represent all disciplines. It differs from the present research in its emphasis on interdisciplinary work purely, wherein the discreet nature of each subject, including art, is retained; on the contrary, the program Education Through Vision lays primary emphasis on visual learning for all disciplines rather than on art specifically.

In order to bring teachers of differing disciplines to the point where they can be critical of the visual exercises employed in the present program and perhaps be able to devise new ones which are fundamental to their separate studies they must undergo exposures which superficially resemble training in art but which in fact are much broader both in procedure and intent. Related, in respect to such teacher training, are such recent summer institutes as the program conducted by the Memphis Academy of Arts seeking to develop the artistic sensitivities of elementary classroom teachers who were drawn from four states bordering western Tennessee. Another aspect of the present research is the design and production of visual guides and manipulative kits. Related to it is the study conducted by Mrs. Hugh Townley under a grant from the Howard Foundation. Here again, however, Mrs. Townley's intent is to organize and produce materials for art rather than for a visual learning process.

Growing out of this program in Education Through Vision are several independent research activities such as the Learning Workshops initiated by the Board of Education of Brevard County, Florida; or the Boston Curriculum Development Study, particularly at the Lewis Junior High School, Roxbury, where past participants of the Education Through Vision program have had notable success in developing writing ability by means of developing visual alertness and acuity. Very intimately related to the present program is the research as to how to evaluate sixteen pilot programs which have emerged from this program in the schools which have cooperated. The Education Testing Service of Princeton, New Jersey, appointed a staff member, Mr. Donald Trismen, as principal investigator. His report is expected in December 1967. Thus, it should be evident, that although the objectives of this program in Education Through Vision are similar to many investigations currently or recently conducted elsewhere, it includes more than any one of them, and, indeed, seeks to organize and unify all.

Purposes

As has been implied in the previous section recounting related projects, the present research is conceived both basically and broadly. Its ultimate purpose is to improve the average motivation and learning capacities by developing visual awareness. This is postulated on the hypothesis that alertness is transferrable from one area of human behavior to another and that sharper insights can be induced through sensory development related to normal verbal means of communication.

Specific Objectives

Specific objectives have been:

(a) To devise visual exercises in two and three dimensions which involve manipulations and decisions with respect to images and constructions; moreover, to relate these exercises not only to each other but also to experiences with the camera.

(b) To provide teacher participants with an understanding of their involvement and to instill confidence relative to a once unfamiliar area on the part of most, thus broadening their academic horizons.

(c) To introduce new 20th century media of expression and communication and help educators become proficient in using this technology to the point where they can pass this knowledge along to their students.

(d) To find ways of relating the several academic disciplines through visual awareness for the sake of improved skills in each.

(e) To find ways to train teachers to train other teachers in this visual area.

(f) To develop "visual" packages to serve as guidelines without inhibiting fresh exploration.

(g) To find ways to evaluate this proposed development of visual learning.

(h) To strengthen programs already begun in schools which had participated during 1963-66 and to find ways to extend this experience with schools who were not able to participate.

METHOD

Teachers were given a variety of visual experiences, or exercises, in two and three dimensional manipulation and in photographic exploration, in the dark room as well as with the camera itself. These exercises were then tried out on high school juniors and seniors all of whom had been exposed to the same experiences the previous summer. The intent was to allow teachers to become adjusted to what they themselves had learned visually and to encourage student responses in a way which would challenge the teachers' conduct of his class --- a strange, at first offensive, but later stimulating experience for both groups. There was however a comparable group of students possessing no such experience upon which teachers could practice with more accustomed routine behavior.

No less important than these basic visual experiences were the seminars, designed to evoke reactions, to encourage constructive critical improvements and to develop personal insights as to the several specific objectives. Certain participants were also involved in evaluating the efficacy of the slide-tapes used to illuminate the program and to serve as reminders or guides.

RESULTS

Although this is a final report on the period for which financial assistance was received from USOE the research itself is not complete.

Specific results with respect to objectives noted above are as follows:

(a) Visual exercises were analyzed and redefined but are still subject to further testing.

(b) Teacher understanding was clarified both as to "new" teachers and veteran teachers.

(c) Teachers learned to perform well with the photographic medium and simultaneously learned how to produce slide-tapes.

(d) Considerable debate concerning the interdisciplinary work took place but none was ever brought to a point of common agreement.

(e) There are no satisfactory conclusions which have been reached regarding the ability of teachers to impart their newfound enthusiasm to other teachers although there is evidence that they can successfully employ visual techniques for the enhancement of such abilities as reading and writing on the part of their pupils.

(f) Ten slide-tapes were designed, produced and tried out on the teachers and have been furnished to sixteen schools to aid further research.

(g) Plans were devised to evaluate this program by Educational Testing Service at Princeton, New Jersey. Donald Trismen has been appointed principal investigator.

(h) Pilot programs have been strengthened in some schools but weakened in others because of changing personnel or administrative indifference.

DISCUSSION

Most programs which attempt to establish curriculum reform limit attention to curriculum content and find that available teacher personnel is lacking in the sort of training necessary to conduct a new program. The research program in Education Through Vision began, instead, with the intent of making decisions relative to any curriculum changes dependent on teacher reactions. It was deemed necessary at the outset to involve more than one teacher from any one school. It was also deemed advisable to include as many school administrators as possible in order to strengthen whatever program a group of teachers might endorse. Thus, by the time the contract, with which this report is concerned, was negotiated a certain amount of research had already been undertaken. There was not sufficient evidence, then, in support of the several hypotheses to invalidate the innovative character of this research.

Consequently, much emphasis has been placed on two factors which affect the success of pilot programs in the schools.

(1) The continuation of capable personnel sufficiently acquainted with the program to maintain it, and

(2) The presence of a diversity of personnel with respect to subject matter teaching in order to strengthen the interdisciplinary aspect of the program. It is to be hoped that the

evaluation to be conducted by ETS following the data gathering will further strengthen the existing program.

The premise that curriculum innovations are best initiated with teachers not only puts the burden of content on the teacher as to his own creative potentials but also this awareness should enrich the teacher-pupil interplay and ultimately the total school environment. Nevertheless, the pupils themselves are the sole and ultimate justification for any curriculum change; not until pupil behavior can be demonstrably affected by a change is the research complete. Pupil reactions were subjectively evaluated during the summer of 1965 and do not provide a substantial body of evidence; however this analysis based as much on pupil comments as on performance demonstrates that the reaction was positive in support of the visual learning hypothesis.

It will be noted in the statistics to be found on page 3 of Appendix A that five new schools were added to the program research in 1965. The reason was twofold. The first being to determine if the teachers' enthusiasm observable during the first two years might extend to a wholly new group; the second to see if the experienced and non-experienced groups might be compatible as a means of calculating future problems. The reaction was favorable and the experienced teachers gained strength through the process of guiding their inexperienced colleagues. During the summer of 1966 however the concentration on a verbal outline (or syllabus) occupied more of the veteran teachers' time in such discussions as how to bridge the gap between verbalizing and visualizing and how to satisfy the need for further study.

Methodological details are provided in Appendices A and B (pages 2 and 52) and should serve to amplify the necessary brief discussion here.

CONCLUSIONS

For the purpose of this report (which is final as to Federal funding but interim as to the scope of the research itself) conclusions are premature. Rather, the research has produced evidence that both the method of working visually with teachers and the development of a curriculum which employs visual as well as verbal skills requires further evidence as proof of the validity of the research. All research is necessarily tentative, otherwise it would not be research. However, it appears that the time is not far distant when more positive statements may be in order. In that event a broad demonstration and training program can be constructed to disseminate findings in behalf of a better education. The obvious implications would appear to be the need for a type of schooling wherein pupils who are now considered to be low in ability, but who do in fact, possess a generally high degree of intelligence may be instructed according to their needs. Until these implications are adequately substantiated it is too soon to make specific recommendations. However, because of its interdisciplinary relevance Education Through Vision may be integrated with the existing academic curriculum without encroaching on other disciplines nor losing a newfound content within vision for its own special value. If, as modest experience presently indicates, students can be motivated to develop greater insights through vision it would appear reasonable to make room within the accepted curriculum; this program already promises to develop such insights.

SUMMARY

The problem is how to provide better learning opportunities than presently exist in the verbally and factually oriented curriculum. The problem poses the question "Can visual education provide the personal involvement which will motivate latent learning abilities?"

The objectives are:

(a) To develop a rationale for selecting certain visual and tactile exercises which may be employed to develop this visual acumen.

(b) To observe their influence on teacher and pupil behavior.

(c) To evaluate the teacher and learning effectiveness (or change) as a consequence of such visual experiences.

(d) To promulgate curriculum change based on the satisfactory fulfillment of these first three objectives.

The method employed has been to expose teams of teachers, representing different disciplines, to certain visual experiences; to discuss them in order to see if they are applicable, in practice, to the several academic disciplines and if they can instill fresh insights within the bright as well as the sluggish pupil. The experiences have involved a variety of ways for creating order by manipulating materials in two and three dimensions and by the photographic processes.

The results are as yet tentative and inconclusive but both teacher enthusiasm and pupil performance with respect to these visual experiences are prophetic of their eventual adoption for the sake of broadening both teacher and pupil horizons. More positive evidence of educational effectiveness is expected from a testing report to be issued by Educational Testing Service of Princeton, New Jersey, in December 1967. That report will be based on tests conducted during 1966-67 at sixteen high school pilot programs which have emerged from this research. Because positive evidence is presently small additional evaluation of ongoing high school programs is needed and is being planned.

APPENDIX A

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

Summer - 1965

SECTION A

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

SUMMER - 1965

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

SUMMER - 1965

STATISTICS

There were 3 groups of participants in the 1965 Summer Session of EV

1) 37 teachers: 12 of them veterans; 25 new teachers
2) 15 Andover High School Seniors who had previously been exposed to the Program
3) 15 high school boys and girls participating in the Phillips Academy Summer Session who elected this course as one of their summer courses

The teachers came from a total of 15 schools: 9 of them previously associated with the EV Program; 5 of them new in 1965. The schools were selected for variety: urban or rural; North, South, Mid-West; some in areas where families were relatively prosperous, others where pupils came from less secure financial circumstances.

1) The 9 old schools:

Abbot Academy, Andover, Mass.
English High School, Boston, Mass.
Dorchester High School, Boston, Mass.
Melbourne High School, Melbourne, Florida
Milford High School, Milford, New Hampshire
North Reading High School, North Reading, Mass.
Allderdice High School, Pittsburgh, Penna.
Langley High School, Pittsburgh, Penna.
North High School, Worcester, Mass.

2) The 5 new schools:

Allentown School District, Allentown, Penna.
Memphis Technical High School, Memphis, Tenn.
Newton South High School, Newton, Mass.
Newton High School, Newton, Mass.
Winchester High School, Winchester, Mass.

The 37 teachers represented the following disciplines:

Art	English	Social Studies & History	Sciences (Bio./Chem./Phys.)	Math.
11	14	2	3	2

Psychology	Administration & Guidance	Languages	Library
1	3	1	1

In addition to Bartlett H. Hayes, Jr., Director of the EV Program, the Research Guidance Staff included:

Gordon C. Bensley, Dir., Audio-Visual Center, Phillips Academy, Andover
Gerald Shertzer, 2 & 3 Dimensional Design, Phillips Academy, Andover
Floyd Covert, Design, Massachusetts College of Art, Boston
Philip Perkis, Photography, Phillips Academy, Andover
Christopher C. Cook, Painting, Phillips Academy, Andover (2 lectures)

They were assisted by the following veteran teachers from the EV Program:

Jeremiah Botelho, South High School, Boston, Mass.
Mavis Bridgewater, Langley High School, Pittsburgh, Penna.
William Childs, Milford High School, Milford, New Hampshire
Robert Duffy, North High School, Worcester, Mass.
Paul Heins, English High School, Boston, Mass.
Lloyd Welling, Allderdice High School, Pittsburgh, Penna.
Grace Whittaker, Dorchester High School, Boston, Mass.
Laura Young, Melbourne High School, Melbourne, Florida

Other personnel assisting the staff in special research:

Paul Kolers, Prof. of Psychology, Dept. of Electrical Engineering, M.I.T.
Ronald B. Epstein, Graduate Student, Harvard, Ass't to Dr. Kolers
William B. Hoyt, Reading Research Institute, Fryeburg, Academy, Fryeburg, Maine
Phyllis C. Hattis, Graduate Student, Harvard

Before the Summer 1965 EV Program commenced 16 slide-tapes covering the range of the course were completed by the staff of the Art Department, Phillips Academy, with the assistance of Russell Munson and Aloysius Hobausz. These slide-tapes (in the order of their appearance in the 1965 Syllabus) are entitled:

SHAKE-UP: "What Do You See?"

LIGHTING

COLOR

TWENTIETH CENTURY LANDSCAPE

THE EYE

PERCEPTUAL SEEING

STRONG SHAPES

SYNCOPATED SERIES

SENSUOUS SURFACE

CONCEPTUAL SEEING

SYMBOLIC SEEING

SIGNIFICANT SLOGAN

PREDICTIVE SEEING

3 D BUILDING

SENSITIVE STUDY

PRIMITIVE ART: Communicating

AIMS OF THE 1965 SUMMER EV RESEARCH PROGRAM

1) To strengthen and solidify the EV courses to be taught in the schools during the year 1965-66

2) Toward this end a Syllabus was prepared by Mrs. Laura Newell Young, Curriculum Specialist, Melbourne High School, Melbourne, Florida. This Syllabus presented the exercises of the EV Course and was intended as a lesson guide for the teachers conducting Pilot Programs; it was meant to be flexible according to their needs.

3) New teachers from the 9 schools which had been working with the EV Program since 1963 were brought in to strengthen the Program in each of these schools and to extend it beyond the disciplines already covered.

4) The 5 new schools introduced to the EV Program in the summer of

1965 were represented by teams of teachers - in each case 3 or 4 -- so that there would be a strong enough nucleus of teachers (in different disciplines) to present the course.

5) The 2 groups of students (one group who had already taken the course and a new group who had not) served several functions:
    a) Those taking the course for the second time were clear about the nature of the exercises - though the slide-tapes were new to them. It was hoped that on their second time through the course their comments on the exercises and the ways of presenting them might be helpful. For the teachers new to the EV Program it would be helpful to observe these students in action. How their experience with EV might have affected their attitude toward general school work was to be studied by both the participating and consulting psychologists.
    b) The new students were provided as "guinea pigs" for the teachers embarking on Pilot Programs in 1965-66 to teach. Their reactions to the exercises and to the slide-tapes would resemble those of students in any of the schools new to the EV Program.

THE STRUCTURE OF THE 1965 SUMMER EV RESEARCH PROGRAM

The structure of the Education Through Vision Program for the summer of 1965 was organized around the 3 groups participating: the teachers - old and new - were the first group to do each exercise (some of these teachers had participated in the EV Program for two summers and had been teaching the course in their own schools); the group of Andover High School students taking the course for the second time were next given the same exercise; and the group of Andover Summer Session students to whom the course was unfamiliar were given the problems last. The slide-tapes -- new to everyone -- were shown in the same order. Each day's work was organized so that the teachers were one half a day ahead of the two groups of students and able, therefore, to practice teaching them (the veteran teachers did this) or to observe the students at work on the exercises. The basic plan was to provide a controlled teaching laboratory: it gave the teachers an opportunity to be taught as well as to teach; and it also provided them with high school students to teach and to observe.

The dovetailing of each group's activities required intricate planning and careful timing. Evening sessions were scheduled for the learning of particular skills - such as the production of slide-tapes - and for meetings of the entire group to consider common problems such as: the planning of the Syllabus; the order of the exercises and presentation of slide-tapes (either before or after the exercises related to them); and the refinement of the exercises themselves. The Syllabus was chiefly engineered and written by Mrs. Laura Newell Young, one of the veteran teachers who had been actively participating in the Program since its inception in 1963, but discussion groups with all the teachers were often held in the evenings.

A record kept by the day and following each group's activities is available; this detailed record presupposes a familiarity with the EV Program and each of the exercises given. For the purposes of this report - intended as a survey of the 1965 Summer research in EV - it was decided to ask certain fundamental questions and apply them to the research as it was carried out. These questions are:

I. What were the new teachers' reactions to

   A. The exercises

   B. The slide-tapes

II. What were the comments, suggestions, criticisms made by the students taking the course for the second time on

   A. The exercises

   B. The slide-tapes

   C. The effects this course had had on the other courses in their school curricula

III. Were there different reactions from the new - or inexperienced - students

IV. What were the veteran - or experienced - teachers' reactions to

   A. The order of the exercises

   B. The effectiveness of the exercises individually

   C. The effectiveness of the 16 slide-tapes

   D. The effectiveness of the EV Course from their own experience teaching it

V. What were the reactions to the EV Program - positive and negative - collected by the observing psychologists and the reading specialists

Before going into a chronological analysis of these questions, it might be helpful to summarize the results briefly, under the same headings.

I. The new teachers at first had difficulty understanding the exercises; at the beginning they were quick to criticize what they didn't know, and their inclination was to verbalize rather than do the work. From the first exercise on, however, once they became involved in the problem, it made more sense - and often they were surprised that they had been able to do something they had not thought they could. It helped these teachers to watch the experienced students doing the same exercises; many of the teachers completed their work - or did the exercise over - by then familiar with the material and more sure of the way to arrive at the results they wanted. As one of them said: "I think my problem is that I'm not used to looking for these things, and what's more I'm still not sure what it is I'm looking for. But after the second exercise yesterday when I went back to the first it was easy." Considering that fewer than half of all the teachers had any connection with the art field (11 of the 37 were Art teachers) it is not surprising that the new teachers were at first mystified by what were basically visual exercises. Indeed, the surprise actually was that in a relatively short time (some in the first week- others by the third) adults who had had very little visual training were grasping these exercises, executing them, and then able to be critical verbally about the results. Until they had actually done the exercises and experienced their own visual reactions (the excitement, for example, of colors interacting on one another), it was impossible for them to verbalize answers - and this was a new and uncomfortable experience for many of them. In general, the most effective exercises for these teachers were those requiring the least specialized artistic skills. By the end of the course the importance of doing rather than talking about the exercises was apparent to most of these teachers.

The slide-tapes impressed all of them from the beginning of the course on. There were few critical suggestions about specific tapes from this group but again it is important that in a total of six weeks they grasped the technicalities of this medium sufficiently so that twelve of the twenty-five new teachers produced slide-tapes of their own.

A meeting held with all the Art teachers - old and new - elicited two conclusions about the EV course in respect to art teaching: that the exercises should be kept in a block not interspersed with other projects in an art course; and that the course as a whole might be very effective as a prerequisite to first year art (p.42). Many of the Art teachers felt that although some of the exercises might be familiar they were presented in a new way. All of them welcomed the opportunity to work and become proficient in the medium of photography: 4 had not had any photography; 6 had had it only at Andover the Summer before; only 1 of the new teachers had had some photographic experience before taking this course.

II. Logically, all the exercises were easier for the students doing them for the second time (of these 15, only 2 "took art"); this time they knew what they were looking for when they began a problem (p.24). They were articulate about the exercises and their possible correlations with other fields. Their comments on the specific exercises are covered in Section II. Their evaluations of the slide-tapes were useful: in two instances, FIGURE GROUND, and 3 D BUILDING, they commented that the slide-tapes were effective introductions to the exercises, while the SENSITIVE STUDY slide-tape they criticized as misleading (in its emphasis on "pretty" things). This group felt that too much dependence on the slide-tapes before the student thought about or experimented with the exercises could be limiting (p.27). They were strong in the conviction that the course was "useful" or "valuable" a second time. "Once is not enough because the first time you don't know why you are doing it," said one; another remarked that the year before the "answer" to a problem was not found out until after doing it - this Summer, knowing the answer, she felt they could go further with it.

Discussing the effects this course had had on other courses in their curricula, one said she could write "more deeply"; another found 3 dimensional concepts in geometry easier to visualize; another saw the relations between various fields more vividly and quickly. (p.23). It was even true that though the students had not seen much connection between the slide-tape, PREDICTIVE SEEING (the process of learning an action by analyzing and synthesizing), and the baseball game they played immediately afterward, one did remark later that before taking the course he had not observed the rhythm in baseball. The conclusion that their friends who had not taken the course were more "narrow minded" indicated that they themselves were aware of its influence beyond the immediate sphere of the exercises.

III. The group of new - inexperienced students - like the new teachers, had some difficulty understanding the exercises at first, particularly those who claimed to know nothing about "art"; (only 1 of this group of 15 had "taken art"). But unlike the new teachers, the new students were less embarassed about trying the exercises they didn't think they could do - such as the still life exercise. Compared to the group of experienced students, the new students took longer to focus on an exercise, tended to get lost in superficial details, and suffered from mechanical problems. Again what is significant is that, in spite of their unfamiliarity with visual material, they did all the exercises with increasing speed and acuity as they went along, and that they became more articulate about what they were doing. Two thirds of the way through the course (after considerable technical difficulties with the still life) when asked what the course was teaching them, one answered that she was having to direct her seeing in a new way, and another that he involved himself with more actual experiences. In a discussion at the end of the course on the dulling effects of habits, one said: "If we heighten our awareness and find more ways of looking at things, this will spread to our other activities and we will notice our habits, being more aware." There was the suggestion that this program be extended to other senses, not just the visual.

IV. The veteran teachers' comments on the exercises are covered in detail in Section IV. Mrs. Young, meeting with these teachers during the six weeks of the Program, incorporated their suggestions into the first written Syllabus of the course which she completed the Summer of 1965. Copies of this were mimeographed so that each of the teachers would have one to work with in their respective schools the next year (1965-66). This group, many of whom had already been teaching EV courses in their schools, were experienced in both the comprehension and presentation of the exercises, and therefore, well equipped to judge the relevance of the slide-tapes. From their comments, almost all the slide-tapes were found to be useful; in some cases -- SHAKE-UP: "What Do You See?" -- they recommended that the slide-tape be shown twice. The one slide-tape they did not feel was successful was THE EYE, which they cited as an example of too much verbalization, showing that by now they had realized for themselves the value of visual experience.

In both groups of teachers, new and old, there were those who urged more specific definition of purpose - or more concrete, tangible results. One of the teachers answered the first: "We assume that this program teaches one to look and inquire, and if we assume that the students can handle the exercises without a definition and find one out afterwards, then the teachers should be able to do it too." Another later remarked that results do not need to be concrete or immediately applicable to be of value. Some worried about the opposite extreme - the possibility of the course becoming too rigid or "structured". Mrs. Young stressed, as she had all along, the intent that the Syllabus be used as a guide (rather than a rule book) and that it should be flexible so as to be adapted to the needs of the individual teacher. The two real achievements among this group would seem to have been the reconcilliation of many different points of view about the teaching of the course and Mrs. Young's successful effort at getting it all down on paper in an organized form - the Syllabus - which the teachers could follow or vary as they saw fit.

V. The testing done by the psychologists - on both the students and the teachers - demonstrating the illusion of movement or the influence of the mind over what the eye sees, was dramatic and of interest to the subjects tested. Just after the first tests, a boy with a polaroid camera came to an interesting conclusion: "I only saw the hydrant but the camera saw all those rocks and trees in the background."

Dr. Kolers, defining his own purpose half way through the summer, said: "We don't really know how the visual system works, how we see what we see. But we construct many things that aren't there with our minds and tell ourselves things - thus stereotypes are created. This process is what we are trying to change.... We hope to expand awareness and responsiveness... If we can get the students to see new concepts in one area then maybe it will benefit them in other areas of experience." A teacher then asked if there were tests for the EV Program to see if and how it does help students. Dr. Kolers answered that the tests so far devised did not measure any influence, yet the production and performance of the students showed marked changes. He said that they were in the process of inventing tests to measure the changes in perceiving. There was disagreement between Dr. Kolers and the veteran teachers as to the usefulness of the diaries kept by the students the first two Summers. He did not feel they did more than reflect the students' desire to please their teachers (p.48). While a new series of tests was never completed by the psychologists to be used the next year in the schools, the later meetings of all the students and all the teachers with the psychologists produced very interesting discussions and comments on the EV Program.

QUESTIONS APPLIED TO THE 1965 SUMMER RESEARCH IN EV

I New Teachers' reactions to: (A) The exercises (B) The slide-tapes

1st week:

Some of the new teachers had difficulty doing the first exercise - Signature - but the more they experimented with it the easier they found it was to do. One remarked that one of the values of this exercise was seeing yourself do something you thought you couldn't do. They found that thinking got in the way of doing - that after a while they had been able to open up.

The question was raised about the efficacy of showing the slide-tape, "SHAKE-UP: What Do You See?", both before and after the first exercises, faster, perhaps the second time.

While observing the experienced - or old students doing this exercise for a second time, the new teachers understood it better and several of them re-did it. One of them said: "After yesterday's work I couldn't see a thing - I think my problem is that I'm not used to looking for these things, and what's more, I'm still not sure what it is I'm looking for. But after the second exercise yesterday when I went back to the first it was easy." After this it became a repeating pattern for the new teachers to do problems over again with the experienced students.

Another of the new teachers, while doing the Color Change Problem remarked: "I wish we could do this teaching Math - It's such fun!" The answer from another teacher, "Well, you can show intersection and union of sets." Observing the inexperienced students doing the Color Change Problem, one of the new teachers remarked: "I didn't know I was going into an art course."

2nd week

With respect to the exercises themselves some of the new teachers complained that the exercises weren't explained enough in general (this seemed especially a problem with photograms). Others expressed the feeling that they were "too mature" to do the work or that the exercise was too elaborate for the point - but many admitted that in the first week they had not known what they were doing.

Some of the participants from the new schools remarked that they felt the EV Program had to be measurable - that it ought to have visible results.

Working with polaroid cameras, this group again had difficulties. They were warned not to forget the importance of the white frame - that everything inside of this would be the picture. They would have to be able to see to take the picture. Their first attempts were not successful. Further experiments were done with light, daylight, sidelight, 2 lights, backlight. Some of the new teachers again felt inadequate.

Colors in Conflict, an exercise given at the end of the second week, was to find 2 or 3 colors (using color-aid paper) which when juxtaposed would vibrate, and then to organize them in a pattern or composition which would increase the tension between them. Two of the new teachers complained that they were confused at the beginning (before they had tried to do the problem) but after they had experimented and done the exercise they seemed to understand it and were pleased with the results. Later when this exercise was presented to the experienced students and the analogy drawn to the play, BECKET, by Anouilh, one of these new teachers complained that this analogy (the two central characters, Becket and the King in constant conflict) was too obvious and would be an insult to the intelligence of her English students. There was difference of opinion on this.

The teachers were shown the slide-tape, COLOR, after they had done the vibrating color exercise. Following the slide-tape they made color transparencies - or slides - with colored gelatins, acetate, watercolors and inks. They were assigned three compositions to execute as transparencies:

- An abstract landscape
- A design to induce some emotion
- A symbol or sign

Again during the introduction of transparencies these teachers were confused but they became excited by the interaction of colors as they worked on the problem and pleased at the showing of their own finished slides at the end of the afternoon.

Following the Sensuous Surface photographs, the exercise in Exploded Texture was done, by isolating a small section of one of the rubbings or photographs and building a 3 dimensional collage of it using materials readily at hand. One of the new teachers felt that this exercise was not successful in that it was too random without better materials.

3rd week

One of the new teachers who had often been critical of the exercises (sometimes by her own admission because she didn't understand) in a meeting of English teachers began to participate positively in a discussion of visual exercises that might be developed to help students in writing essays.

Having seen the slide-tape, FIGURE GROUND, and having done the Figure Ground exercise, the new teachers were shown a second slide-tape, STRONG SHAPE, so that before doing the next exercises they would see the interdependence between figure and ground and the equal importance of the shapes themselves and their negative spaces. They were assigned to take two photographs of a "strong shape" in relation to its background which would be photographic equivalents of the Figure Ground exercise.

This group then went on to do still life exercises: drawings in black and white of a still life as they saw it; then a Cubist organization of the same still life with tonal relationships; and finally a 3 D color exercise of the same still life. The new teachers were not sure of themselves in this exercise because they were afraid they could not execute it perfectly. They were discouraged and set back by this exercise for a few days but later many of them were glad to have done it. One remarked, while watching the new students try the same exercise, that she had found it very difficult because it was so different from the previous three weeks' work.

4th week

CONCEPTUAL SEEING slide-tape was shown twice, the second time with commentary by Mr. Tulysewski, a veteran teacher presenting the exercise. He analyzed the four seeing concepts demonstrated on the tape. They had completed their experiments with realism (which he defined as a 19th century convention); they would work with Cubism - a 20th century convention. The new teachers were more receptive to this part of the still life exercise.

The exercise using color to produce the illusion of 3 dimensional space on a 2 dimensional surface was easier for the new teachers to execute. (They drew a set of blocks arranged in the middle of the studio and, using colored paper, made some recede and others appear in front).

After seeing the slide-tape, SUGGESTIVE SLOGAN, the new teachers were given four quotes to illustrate by photographs. The question was raised whether this exercise was too English oriented - the quotes given all being from poems by Whittier, Pope, Eliot and Frost. Some of the teachers felt that the quotes were "too poetic" - perhaps too literary to parallel visually.

5th week

The new teachers were introduced to Action Painting - which they all enjoyed. They observed that despite all the spontaneous qualities in this exercise a form of design or organization still emerged in each one.

The slide-tape, 3 D BUILDING, was shown to the new teachers before the paper bending and paper construction exercises were done. The questions were posed: "What forms or what purposes evolve from a given material" - or conversely, "What material in what form can best fit the given need?" The properties of paper were explored. Most of the teachers were baffled by this exercise - but the geometry and math or science teachers seemed to have an easier time coming up with solutions.

After seeing the SYNCOPATED SERIES slide-tape, many of the teachers commented that the slides seemed better fitted for the Figure Ground tape.

The Visual Analogy problem was difficult for the new teachers (they were to find two things to photograph which would appear to be the same in the picture but would actually serve different functions). The flexibility of the camera was found to be useful; scale and distance were discovered to be the crucial variables.

After the slide-tape, PRIMITIVE ART: COMMUNICATING, was shown a series of staged pantomimes were done to point up some of our modern rituals. These were performed by the veteran teachers under a strobe light (actions such as: two knife fighters; a couple getting married; a man doing calisthenics; a woman applying make-up). The emphasis here again was on the need for recognizing habits in order to move beyond them. One of the new teachers (who had often been quick to criticize in the earlier exercises before she had taken the time to understand) was quick again to say she didn't see any relevance to this. The experienced teachers did not agree with her; nor did many of the other new teachers.

The new teachers were shown the slide-tape, SENSITIVE STUDY, and then sent out with cameras to do the exercise - to take photographs which had a particular meaning to each of them. They had difficulties finding subjects on the campus and also wished they had more time to spend on the problem - but it was explained to them that the exercise was intended to emphasize intensive seeing and a concentrated experience.

6th week

Prints made with vegetables, string, sponges and other unusual printing materials were made by these teachers who were surprised that the resulting images were so interesting - demonstrating the fact that the identity of a material or object can change when its function changes. (Perhaps because the materials were more within their control than in the preceding photography exercise, the new teachers were more enthusiastic about this exercise.)

Mr. Perkis (Phillips Academy staff teacher of photography) met with the new teachers to discuss photography in their schools. He said that he had worked with teenagers and found that photography could reach them when nothing else could. He emphasized the fact that very little equipment was needed but he stressed the importance of the students' doing their own developing. He claimed that it is not difficult to get students into drawing pictures from taking snapshots because photography is not as frightening as being asked to draw something. Mr. Perkis also discussed the usefulness of the Polaroid camera (in its producing immediate results) saying that this was not a photography course but an exercise in seeing. There was a brief discussion among these teachers of other areas in the regular curriculum where photography might be useful: as part of a science course; in an architecture course being able to take photographs of various styles of architecture; the possibility of using photograms in a philosophy course.

At the end of the 6th week, Dr. Kolers met with the new teachers to ask them their reactions to the exercises and their evaluation of the course as a whole. Mr. Hoyt, the Reading specialist, gave his reactions to the exercises, saying that he felt they fell into three categories: those one could do; those that depended on a skill one didn't have (possibly the photography exercises were meant here); and those that depended on art - which he couldn't do. Yet he said he felt that he did look at things in a new way although he couldn't say exactly what the course had done for him yet. One of the new teachers wondered whether the students could not be shown some of the exercises - such as the Color Change problem - without having to spend so much time actually doing them. Dr. Kolers refuted this by saying that the crux of learning is active participation. Another member of this group said that although he was not sure he could do some of the exercises, he would work with those he understood and could do and that as a result of the course he felt that he was a richer, fuller human being.

The last morning of the course was spent by all the teachers - old and new - looking at the slide-tapes (and some movies) taken and produced by the teachers during the Summer. There were 14 slide-tapes, only 2 by veteran teachers. Comments and specific suggestions were made after each; in general, they were well liked and seemed successful.

II Comments, suggestions, criticism by experienced students

A. On the exercises
B. On the slide-tapes
C. Effects of this course on other courses in their school curricula

---

1st week

The returning students were asked if the course they had taken the Summer before had affected any of their subjects during the school year:

- One girl answered that her view of poetry had been changed
- Another said that composition was easier - she had more "free thought" and "could write more deeply"
- Someone else found that geometry was easier

Doing for the second time the Color Change Problem - placing two squares of the same colored paper on two different background colors (and finding that the squares of the same color can look different); then trying to make two different colored squares look the same by varying the backgrounds - these students did not find the problem difficult. They discussed the nature of complements and primaries on the color wheel. This group discussed the correlations of this problem to political situations and music. They were very articulate. Many of the students in this group told one of the old teachers that they liked the course better this year and liked picking it up where they left off.

2nd week

The experienced students, even with new approaches to the Meander exercise, found it boring and too long.

Polaroid and still life exercises with lights were easier for this group which had done them before.

The Rubbing exercise, in which the student produces an actual graphic record of a textured surface, was easier for these students the second time. The teacher emphasized the difference between pattern and texture, and posed the question: what and how much does the rubbing tell about the source? Some answered that there was a direct relation between the surface and the image. A surprising example of a tree root rubbing was shown - which no one could identify - demonstrating that occasionally a 2 dimensional image is created true to the surface, but presenting a wholly new and distinct identity of its own.

This group found it easy to move from the specific exercise to its relation to other fields. Various styles of writing were mentioned and compared to the rubbings, the point of comparison being that lights and darks express different depths. James Thurber and James Baldwin were cited as examples. In music it was pointed out that each instrument has its own texture and sound.

Following the rubbing exercise, a discussion took place between the new teachers and these students:

Q. Would these students have noticed the lights and darks in writing and in music if they had not taken this course before?

A. Yes, but not in relation to texture

. Another student volunteered that the year before the "answer" to a problem was not found out until after doing it; this Summer, knowing the "answer", she felt they could go further with it.

- Another said she saw the relation between various fields more vividly and quickly
- Another found 3 dimensional concepts in geometry easy to visualize while others in her class who had not had the course did not.

3rd week

The old students were shown the slide-tape, FIGURE GROUND, dealing with the problem of reconciling opposites - black and white - and this led the group into a discussion of unity vs. dividedness and analogies in history with situations in conflict. An example given was federal vs. state governments: in the Constitution there is a reconciliation of the two opposing forces; in matters of civil rights there has been conflict ever since the Civil War.

After seeing the slide-tape, they did the Figure Ground exercise. *Asked how the exercise compared with the year before,* the students answered that they now knew better what they were heading for.

They all agreed that this slide-tape was a good one and an excellent introduction to the exercise.

4th week

CONCEPTUAL SEEING slide-tape was shown to the returning students and afterward the teacher demonstrated how to create illusions of depth on a 2 dimensional surface. She asked how many of these students "took art". Only 2 of the 15 raised their hands.

The box exercise (using color on a 2 dimensional surface to create the illusion of space) was carried out by these students with comments that they now knew more about color than they had. They considered the effects of surroundings and backgrounds on the colors of the boxes receding or moving forward in space.

There was a slide-tape shown to both groups of students on analysis and synthesis, PREDICTIVE SEEING, (which demonstrates the learning of a sport, pole vaulting, on this basis). Following the slide-tape, a softball game was held between the two groups of students. When asked if they analyzed and synthesized while playing, they replied: "Are you kidding?"

5th week

These students seemed to accomplish more with Action Painting than the "new" group but this may have been due to the difference in approach of the teacher.

SYNCOPATED SERIES, a slide-tape, was shown to this group with good response.

The exercises following it (a photography exercise to find a pattern broken in a dramatic way) were done with enthusiasm and considered successful.

These students did the Visual Analogy problem without difficulty but were criticized by Mr. Welling, who presented the problem, for confining their comparisons to man-made objects. He suggested comparing forms in nature or a natural form with a man-made form.

The slide-tape, 3 D BUILDING, helped as an introduction to the paper construction exercises and the students preferred this year's presentation of the problem in that it was less high-pressured.

6th week

After seeing the SENSITIVE STUDY slide-tape, the old students did the camera exercise. They criticized the slide-tape as being misleading in that it only showed "pretty" things, therefore they felt they should only photograph "pretty" things. They said it should be explained that the slide-tape expressed only one person's point of view or feelings.

They commented on taking their own photographs that they had too much freedom.

About the use of slide-tapes in general, the returning students felt that they were followed too much (they had done the course the year before without them).

The "Old" teachers performed the modern pantomime (which they were now calling a "Happening") again for these students, before they were shown the slide-tape, PRIMITIVE ART: Communicating. They were asked after the Happening what this would look like to an African who had never left his country; the answer: "like a strange ritual". Then the students themselves did a Happening, based on conventions and habits. Theirs included: girls washing their hair; a boy driving a car; a piano player; golfer (etc.) and at the end, some did rock and roll while the rest screamed and cheered (in pantomime). The teachers were impressed. It was pointed out in the discussion that there is nothing "bad" about rituals; also that it is too bad sometimes when a ritual is broken. Mr. Hayes observed that it is important to notice the ritual and think beyond it.

they were then shown the slide-tape, PRIMITIVE ART: Communicating, and a long discussion followed as to what rituals we carry over from old cultures, what new systems of building or communicating become rituals, and what the terms "symbol" and "ritual" mean.

A meeting was held with Dr. Kolers, all the teachers, and both groups of students to discuss the EV Program as a whole. His first question was to the old, or returning students: did they find the course useful or valuable a second time?

- One replied: "Once is not enough because the first time you don't know why you are doing it."
- Another felt the results were more sophisticated the second year and that the problems were approached in different ways; in general, there was a more organized attack on each problem.

They were next asked if they'd been bored repeating the exercises and how they felt about the time allotted to each. One of the students answered that there were only a few exercises which they didn't like. They liked the exercise with colored boxes and didn't feel enough time was given, whereas the paper bending exercise was mentioned as one they did not like. The students felt it was too hard and that they had been given too many examples to start with; they also remarked that pure experimenting had been suggested after trying to solve the problem - that it should have come first. Mr. Shertzer (Art Department, Phillips Academy) remarked that after his Winter students have mastered it they can work better in any field. Another exercise the students said they didn't like was the Exploded Texture exercise which they felt was pointless.

In response to the question as to whether there was too much emphasis on vision, one student said that she would have liked working with the other senses. Asked whether they thought this was an art course, a student replied that art was merely the medium.

Later, when Dr. Kolers talked only with the students,their conclusion as to the value of the course was that their friends who had not taken the course were much more "narrow minded".

III Reactions of new - inexperienced students

1st week

After seeing the slide-tape, SHAKE-UP: What Do You See, and doing the first exercises (Signature), there was a brief discussion. One boy remarked: "Well, it's like a positive, negative graph... a cartesian co-ordinate system."

Some of these students had a difficult time with the Color Change Problem, particularly those who claimed to know nothing about "Art". Once they actually started doing the problems, they became more interested and able to see the color relationships. By and large, they had more difficulties understanding the problems at first. The observing teachers felt that the inexperienced students were more confused than the returning group - and less enthusiastic.

2nd week

One of the new students complained that they had different teachers every day - some good and some not.

This group (new students) also had difficulty with the Meander problem. They felt that it had an over-all value in respect to recognizing proportions but that two hours was too long a time for it.

Polaroid experiments with the new students produced one interesting comment: "I saw only the hydrant, but the camera saw all those rocks and trees in the background."

These students found the rubbing exercise easier to do than to talk about. Possibly because the teacher who presented it had some difficulty communicating with the class, one girl remarked that the whole discussion had been too involved with semantics, although another student understood the textural implications when she related the exercise to an orchestra as a "weaving together of a lot of sounds."

One of the new teachers suggested that a mimeographed questionnaire be given to the students asking for their: opinions re. exercises; suggestions for improvement; ways exercises relate to other subjects. (These were done and filled out later in the summer, but were found to be too brief to be of much help.)

3rd week

Although they had seen the slide-tape, FIGURE GROUND, this group was slow to connect on the exercise.

4th week

Only 1 of the 15 new students had taken art. The still life exercise was difficult for many of them but they were less embarrassed about trying it than the new teachers.

Mr. Epstein did some testing on these students. He asked them what the course was teaching them and where they felt it failed - if they did.

- One answered that she was having to direct her seeing in a new way.
- Another that he involved himself with more actual experiences.
- One said that the course was just giving new names to what he had already seen before.

Mr. Epstein said afterwards that he was disappointed in this discussion - that he had expected more criticism from the students and perhaps they were just saying what they thought they should.

This group was sloppy about the quotation/photography exercise. They talked and thought it out rather than seeing and doing it.

5th week

There were some complaints by the observing teachers that the Action Paintings produced by this group had been restrained by the somewhat pedantic approach of the teacher who had presented the exercise.

The exercises that followed the showing of the SYNCOPATED SERIES slide-tape were more difficult for the new students than for the old (or returning) group, - although the slide-tape was new to both groups. The new students tended to get lost in superficial details (focusing too much on texture) and to suffer from mechanical difficulties.

The new students had a great deal of difficulty with the Visual Analogy problem, possibly because of the brevity or limitations of the introduction given.

Although they watched the slide-tape, 3 D BUILDING, there was less enthusiasm among the new students about undertaking the Paper Construction exercises.

6th week

The new students saw the slide-tape, SENSITIVE STUDY, and then did the exercises - with somewhat disappointing results. It was too wide a topic, they felt. This group was in favor of showing the slide-tapes before the exercises (a view not shared by the returning students, who had taken the course the first time without slide-tapes and were opposed to following them too closely).

The new students were given a performance of the "Happening" and asked what they saw. "Everyday things," they answered. A discussion followed, moving from being aware of habits to heightened awareness - of both vision and hearing. They then saw the slide-tape, PRIMITIVE ART: Communicating, which led into further discussions of awareness. One of the students suggested that the beginnings of man's attempts to communicate are primitive art and that the participants in the Happening were doing it again looking for a new way to communicate. Another pointed out that in primitive art man starts out expressing himself in a way which is unconventional - and then because it is repeated it becomes convention. A third said: "We must go beyond our primitive-like habits to see beyond them just as the Cubists did with primitive art." In respect to heightened awareness, one student remarked that he had become more aware of the rhythm in a baseball game. One of the veteran teachers asked whether they had enjoyed this course. The student who answered said her feelings were not exactly enjoyment but somewhere between enjoyment and awareness - "A realization that you're really there - a kind of fulfillment." There were two other interesting comments made by these students on habits and heightened awareness. One said: "If we develop habits we're not aware of then we're in danger of becoming dull, thus in vision if we heighten our awareness and find more ways of looking at things this will spread to our other activities and we will notice our habits, being more aware," Another: "I was standing in New York and I shut my eyes and I heard lots of things I had never heard before. You could heighten your sound awareness and realize sound habits. Why couldn't you have a program of senses, not just one sense?"

IV Veteran Teachers' Reactions To:

A. Order of exercises

B. Effectiveness of exercises

C. Slide-tapes

D. Effectiveness of EV Course - from their experience teaching it

---

1st week

In an early discussion by the old teachers of the Syllabus (then in its planning stage), Mrs. Young stressed the point that the questions in it are purely suggestive - the emphasis should be on the discussions following the slide-tapes and the exercises.

- One teacher raised the problem of the less bright students having difficulty with some of the exercises
- Another teacher mentioned the paper folding exercise as being very difficult for some
- Mrs. Young answered by saying that the Syllabus was meant only for the teacher and intended to be flexible according to his individual situation

One teacher asked to see the slide-tape, SHAKE-UP: "What Do You See?" again, wondering whether the music detracted from its visual impact. On second viewing she decided it was good. All the old teachers found it very satisfying to see for a second time.

There was another discussion of the Syllabus conducted by Mrs. Young with several of the old teachers and the specialists. The question was raised by Miss Hattis that there was too much stress on analogies. Mrs. Young explained that the course is "reaching for a visual metaphor - or models - to spark the imagination". Mr. Hayes had said just before this that "Education Through Vision is training to conceptualize through the eye".

Miss Whittaker pointed out that the general purpose of the EV Program should be discussed more so that the group would not pick on individual exercises without understanding the whole and relating them to it.

Some of the old teachers were asked how they had found teaching the course in school:

- Mr. Botelho said that he had had to do it on his own time
- and found it difficult
- Miss Whittaker said that all her students had loved it
- Both old and new teachers agreed that the course should be a separate one - not incorporated into another subject

Asked about their reactions to the Meander exercise (a repeating design used decoratively and involving proportions), one of the old teachers said that it required too much artistic ability; others found that it was boring.

After watching "THE EYE" slide-tape, one teacher remarked that it demonstrated how difficult it is to make a slide-tape. Others were in agreement that it was not too successful, that it was a good example of too much verbalization in a slide-tape.

2nd week

In the presentation of the Rubbing exercise to the teachers (an exercise which reproduces the physical texture of a surface graphically) some questions were raised by the new teachers and answered by the old teachers:

Q. Is there a difference between pattern and texture?

A. There is a difference between pattern and the pattern of a texture.

Q. Are there differences between visual and tactile textures?

A. Yes, two of the variables to visual texture being distance and light

After the teachers returned from making their rubbings (minimum of 6 - maximum of 8) they were asked to write brief verbal descriptions of whichever of their rubbings they thought the best. Apparently these papers were not completed because the teachers were not clear as to what was wanted - a description of the rubbing or of its source. In the later discussion the point was made that it is difficult to describe a texture and more meaningful to see or feel it.

Mr. Hayes called a general meeting to evaluate and discuss the EV Program as a whole. He began by redefining the aims for the group, saying that he did not feel that the original plan was working yet.

- The plan for the 10 original schools was to reinforce their respective programs by bringing in new people so that the nucleus in each of these school systems would be strong enough to institute the EV Program.
- The function of the new schools was to form a body of opinion.

A question was raised from the floor that there was not enough discussion about the reason for, observations on, or value of the exercises and their relevance to the individual school systems. To this Mr. Hayes replied that the whole group should continue meeting at 4:00 p.m. to debate on the specific exercises. Mr. Hayes also suggested that the teachers hold more discussions with the experienced students for their reactions to the problems a second time, and with the inexperienced students for their fresh reactions.

Mr. Hayes mentioned that some of the slide-tapes could be improved: because of limitations of time and facilities at Phillips Academy, he wondered if the individual schools could plan to work on the tapes when they returned. With this in mind, time for them to gain experience with slide-tape production had been scheduled in the evenings.

In the discussion that followed, one of the veteran teachers said: "We need some sort of definition of purpose." He was answered by another veteran teacher who said: "We assume that this program teaches one to look and inquire, and if we assume that the students can handle the exercises without a definition and find one out afterwards, then the teachers should be able to do it too."

Some of the new teachers agreed that they had diffculty getting ideas from the old teachers as to how the program had worked for them in their own schools and what their impressions had been.

A meeting was held of all the English teachers in the EV Program with Mr. Edmonds (Phillips Academy English teacher, participant in the EV course the first Summer). Mr. Edmonds discussed how he tried to fit the various exercises into his English classes. He began by saying that he had found these visual exercises useful with respect to two obligations he felt they all had as English teachers: to develop the student's perception and his working vocabulary. He read a description of a rubbing by a P. A. student during Winter session. The teachers agreed that this showed good use of concrete terms.

- One of the old teachers asked whether it would have made any difference if the student had not actually gone out and made a rubbing - but had just seen one.
- Mr. Edmonds answered that the tactile emphasized the visual and the student's being able to feel something made it more vivid.
- Another teacher added that this exercise reinforced the idea that the more senses we use, the more aware we are and the more successful our writing and communication become.
- Mr. Edmonds observed that in his experience he has found a lot of resistance to analysis among students, especially in 10th grade, some of which is overcome when they are asked to analyze the rubbing and describe what is left out.

Mr. Edmonds next showed a picture which he first asked his class to describe in one sentence, and then to write a paragraph about - enlarging on that sentence - by means of which he develops a system of support and generalization. Mr. Edmonds described other exercises which he had initiated,one aimed toward verbal acuity, and another in which the students analyze the ways in which the use of color can enhance the "message" in an advertisement. He last demonstrated his use of the Vegetable Print exercise, pointing out that as many students don't take their writing seriously, they had the same "take it for granted" attitude about celery. Being forced to re-evaluate it as a printing material (using it to make prints with ink on paper) was analagous to being forced to redefine words. The variations in the uses of each became more apparent.

In the discussion that followed this meeting, apropos of the use of the EV exercises in English classes, one of the old teachers summarized by saying that after giving her English students these EV exercises she found that it was easier to talk with them about style; they could express themselves better; their vocabularies were enlarged and they understood the meanings of words better.

A meeting was held with Mr. Hayes, Mrs. Young, and the Math and Science teachers, in which some of the visual symbols used to define ideas in these fields were discussed.

- Mr. Papp gave some examples in Physics analagous to some of the EV exercises:
  - Microscopic photographs/rubbings
  - Straight-Curve exercise/photo of ball going through gas
  - Structures in the Universe/atom models
- A Geometry teacher said she found it difficult to get students to "see" in Geometry; with such problems as a locus, both the Curve-Straight and the Figure Ground problems would be helpful; she said the concept of textures varying with

scale is helpful in explaining non-Euclidean Geometry

Mr. Hayes commented on the expected use of the intuition in English whereas in Math or Science it has to be suggested. He wondered if the EV exercises couldn't be done intuitively - i.e., in Biology a student is asked to go and investigate something rather than being told by the teacher how it works. Could the vibrating color exercise be done by asking the students to take 2 colors and see what interaction they produced? Several of the new teachers felt that what explanation had been given first was important. A suggestion made by an old teacher was to have the Math teacher introduce the exercises in Art class and vice versa.

3rd week

A meeting was held with teachers, old and new, Mr. Hayes and Mr. Corson, Administrator of Milford High School, who took the EV Course the first Summer. His concern was how to push the EV Course on the Administrators' level. He reiterated the point that it was up to these teachers to "sell" the course to their administrators. There was discussion as to whether the course was best suited to high school or elementary curricula, whether it should be approved by the states so that it could be a credit course, and finally, whether the time had come to teach the course in teachers' colleges. Mr. Hayes reminded everyone that this is still a research program and cannot go into graduate schools until it is tested in student situations.

A second meeting with English teachers was held. Mr. Welling demonstrated to the teachers how he had worked the course into his English program with 8th graders. He mentioned the following exercises which he had devised:

- Analysis of magazine ads successful because of certain colors and design
- "Selective Seeing" exercises done with cameras
- Visual analogy/Verbal metaphor exercises
- "Haiku": the students find a picture and from it compose a Haiku poem ("A verbal snapshot")
- Students make collages of a poem
- Visual etymologies
- Personality collage exercises

Miss Whittaker followed Mr. Welling to show slide-tapes done by her students, important because they were done completely by the students. She stressed the point that perfecting the tapes was less important to her than the students' complete identity with them. They did slide-tapes of poems and in this process became much more aware of the ways of studying and reading poetry.

A meeting was held with the Art teachers and many said that these exercises had helped in their Art classes. One of the veteran teachers asked how the EV program could be put into a regular Art course: it was agreed, first, that it would be better to keep all the exercises together in one block - rather than separating them and interspersing them with other projects; and second, that the course might be most effective as a pre-requisite to first year Art.

This led into a discussion with the old teachers and the new teachers as to how they planned to present the EV courses in their respective schools. Mr. Hayes suggested that the Art group could try to come up with some new exercises - and the reasons for them - and then at a later discussion they might invent problems for their own situations.

Mrs. Young conducted a meeting with the old teachers. She asked first for their opinions on the order of the exercises - and whether they should be shortened or lengthened.

- One suggested that the Figure Ground exercise should come much sooner.
- Another said that he felt the Program was becoming too rigid. He queried the establishment of a Syllabus - or determining how long an exercise should be.
- A third mentioned some exercises he had invented where he felt the transfer of the already existing exercises was not clear enough. He suggested that an additional sheet be added with further exercises where needed.

In reply to questions about "Objectives", Mrs. Young said that much teaching has become abstraction. This Program, she continued, is an exercise in creativity: instead of starting with the abstract and arriving at the source, the intent here is to start with the source and possibly move to an abstraction. The 3 dimensional model which may be understood visually impels looking. Mrs. Young requested that the teachers all read the Syllabus carefully.

4th week

A Social Studies meeting with Mrs. Young and the old teachers was held to discuss relations of the EV exercises to these courses. The obvious relationship of the crumpled paper exercise to topography and geography was mentioned. There was a discussion of the relation of collage to varying cultures. Mrs. Young asked the teachers to do some thinking about specific exercises that could be introduced relating to Social Studies. No new contributions were made at the time.

5th week

Following the slide-tape, PRIMITIVE ART: Communicating, the veteran teachers staged a series of pantomimes under a strobe light in the auditorium, to point up - in a dramatic way - our modern equivalents of primitive rituals. They emphasized the concept that one must be aware of habits to move beyond them. This produced some sharp negative criticism from one of the new teachers who could see no relevance to it, but strong support from many of the teachers, old and new, who could. There was considerable discussion of the EV Program and some comment on the curriculum. Another of the new teachers expressed the wish that the program could be more structured but there were several who did not agree with that, who were wary of the Program's becoming too rigid. One of the old teachers pointed out that the results did not need to be concrete or immediately applicable to be of value.

V Reactions to EV Program observed by Psychologists and Reading Specialists

1st week

Mr. Hoyt, Reading Specialist, objected to the Signature - or writing - exercise (one step of which is to write one's name backwards) because of those children with remedial reading problems who have to be taught not to do this. He conceded that they are only 10% of the students. Later the possibility that these students might excell at this was raised as an advantage rather than a disadvantage to them. Everyone agreed that the habit of writing one's name, whether one might be right handed or left handed, demonstrated the point of this exercise better than any other kind of drawing would - that being asked to draw even a simple table might result in many students saying: "But I can't draw!" It had been pointed out by Mr. Shertzer (member of the Phillips Academy Art Department teaching this exercise), that due to habits - or patterns of thinking and doing - we customarily use only 25% of our minds.

The new students were taken by the Psychologist to a darkened room where they first looked at one pin-point of light and then at three lights. Some saw the lights moving. Mr. Epstein explained that in the dark there was no frame of reference and called the illusion of movement an "auto-kinetic" effect. He said that an important part of seeing is how frames of reference interact upon themselves.

2nd week

The new students were taken by Mr. Epstein to do some more experiments: first, they danced under a strobe light to some rock and roll records. They discussed what they saw. He then assigned them some homework - to do one of the three following things and then write about it.

1. To lie in a bath for an hour with their eyes shut and see what they could see
2. To stare at a candle in a dark room
3. To walk around and consider only one's own breathing

They were to write these up in two ways:

1. As pure observation or description
2. Analytically: to determine what they thought did - or did not - happen and why.

In a discussion with these same students, Mr. Epstein remarked that he supposed many of them were confused as to why things appear to move when they don't - the pin-point lights, for instance. He said that scientists, even now, only know part of the answers, therefore: "We must be concerned with what we are seeing and figure out what the rules are; we must predict what you are going to see in terms of you - what you do and what you're seeing."

After their first exercises with Polaroid cameras (immediately following the above discussion) one boy commented: "I only saw the hydrant but the camera saw all those rocks and trees in the background."

Mr. Epstein administered a test to the experienced students first and then to the inexperienced students. Each student was given a paper headed, "Lightness - Darkness Quizz", divided into two columns vertically, with headings at the side: 1,2,3,4, each containing three different pairs of colors. The students were given 15 seconds for each pair; they were to check whether the left or right color of each pair was the darker.

3rd week

A meeting was held with Dr. Kolers, Mr. Epstein, Mr. Hayes, and all the teachers to explain to the group the psychologists' function in the EV Program. Dr. Kolers (having been introduced by Mr. Hayes as the "function man" in the Program) said: "We are trying to teach people to open their minds through their eyes to see things for themselves instead of having to be taught to see them..... We don't really know how the visual system works, how we see what we normally see. But we construct many things that aren't there with our minds and tell ourselves things - thus stereotypes are created. This process is what we are trying to change. We hope to bring out more awareness and responsiveness... If we can expand the students' minds, open their eyes in a new way, and get them to see new concepts in one area, then maybe it will benefit them in other areas of experience."

Q. Mr. Childs (a veteran teacher): "What about tests for the EV Program to see if it does help the students?"

A. Dr. Kolers: "The paper and pencil tests that have already been devised don't measure any influence whatsoever yet the production of the students shows significant change in performance. This Summer we are trying to invent tests to measure the change in perceiving. It is clear that there is a change but the question is: can it be measured? I.Q. tests really aren't valid because the intelligence of the child makes little difference on the level we're working with."

Q. Mrs. Young: "Why is there no diary?" (Note: diaries were kept by the students Summers 1963, 1964)

A. Dr. Kolers: "Kids 15 and 16 want to please their teachers - the diaries were merely impressive statements but they didn't ring true..... The diary defeats the purpose of the program because it forces the kids to use the same cliches that we are trying to get away from in the program".

There was difference of opinion between several of the veteran teachers and the psychologists on the usefulness of the diaries which had been kept by the students the first two years of the program. The teachers used the first Summer's diaries; the second year, the keeping of the diaries had been more drudgery for the students and they had copied from one another.

One of the teachers asked if the students in their schools would be observed and tested and the answer was yes. The same teacher asked if the exercises were well enough worked out. Dr. Kolers answered that they were not adequate - that people had not worked enough in this area yet. (The Syllabus was not yet completed). When asked what his objective was, Dr. Kolers answered: "We want to teach you to see things in new ways. If you teach kids about seeing it will make them better students and eventually they will be more creative and constructive."

Mr. Hayes summed up the evening's discussion: there seemed to be two main drives - the dedication to the diaries and the challenge of the rapport with students. Then there was the question of objectives. He suggested Mr. Bensley's summary: "To increase areas of awareness and therefore achieve a better learning process." Mr. Hayes urged the teachers to cooperate with the psychologists in whatever testing they wished to do.

4th week

Mr. Epstein took some of the teachers to the Drama Lab. for testing:

- He did the experiments with pin-point lights. Two of the new teachers were critical of this experiment; neither saw the lights moving.)
- He showed Albers color slides under a strobe light which made them appear to move. These experiments impressed the teachers more.

Mr. Epstein did some further testing on the new students. He had expected more from this discussion and concluded that perhaps the students were saying what they thought they should. He also tested the veteran teachers who were more receptive, especially in the experiment where they thought they could see something moving when it was not. There was much discussion about this and Mr. Epstein pointed out that the mind is a very strong influence on what one sees ("That it wanted to see the lights moving") and that they should be aware, once they were outside, that their minds made them see things.

6th week

Dr. Kolers met with all the teachers and all the students. Mr. Hayes introduced him, saying that the reason for the meeting was to talk frankly about the EV Program. (The specific remarks made by the experienced students about the exercises and the course as a whole have been covered in detail in Section II of this report). In general, the returning students had been interested in the course the second time and found it even more rewarding. They discussed in detail with some of the veteran teachers possible further correlations of the course with other courses in their curricula: English, History, Philosophy, all mentioned in respect to further uses of collage. The application of the Exploded Texture exercise to music was mentioned - and a new teacher emphasized the close relation to music in all the exercises.

The question was raised by a veteran teacher (whose field was English) whether there was too much emphasis on vision. "But our nominal purpose is to change our ways of seeing." Miss Hattis asked if they considered this an "Art" course? "No" answered one, "Art is merely the medium." There was some disagreement on this, but a veteran teacher answered it fairly conclusively by pointing out that the proof that it was not an "Art" course might be found in that the still life drawing exercise - which was closest to Art - was the one which most people had difficulty with. It was agreed that Art teachers were needed (presumably in each team) in order to learn the techniques but that teachers from other fields were helpful in order to have various viewpoints.

Dr. Kolers met separately with the old - returning - students who felt that their colleagues who had not taken the course were more narrow minded, and said that they themselves had felt more open and at ease with their teachers.

Dr. Kolers then met with just the new teachers. One said (after some specific remarks about the exercises already quoted) that he did look at things differently now. Two of the new teachers queried the amount of time spent by them observing the students at work. In answer to one of the new teachers who asked whether some of the exercises couldn't be seen without actually being done, Dr. Kolers replied: "The point of the Program is to correlate demonstration and participation. The crux of learning is active participation." He said further. "It amazes me how you still need verbal tags and little verbal cliches. We are trying to get you to give up these things and live with the experiences."

APPENDIX B

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

SUMMER - 1966

SECTION B

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

SUMMER - 1966

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

SUMMER - 1966

STATISTICS

The participants in the 1966 Summer Session of the EV Program were all teachers: 31 in all. Twenty-seven of them were new to the Program; 4 were veteran teachers who had been conducting EV Pilot Programs in their respective high schools - and had been members of the EV Program since it was founded in 1963. These 4 were invited back as a special committee to work on the Syllabus (a first working draft of which was prepared by Mrs. Laura Young the previous Summer - 1965).

It was felt by the Staff planning the summer Program for 1966 that the groups of high school students given the EV Course the second and third Summers had provided adequate experimental research at that level. Since the EV Course had been conducted in the high schools for the year 1965-66, in practical respects so far as the students were concerned, it was launched.

The main objectives now were, first, to extend the course to more teachers in as wide a range of disciplines as possible, and, second, to refine the Syllabus. In order to strengthen the nucleus of teachers familiar with the EV Course in each of the 15 schools which have been identified with the program, it was decided to invite the new teacher participants only from those schools (not adding any new schools to the list at this time) and to ask that 2 teachers - especially from the fields of History, Mathematics, the Sciences, Music and Languages (English already having been strongly represented) - be recommended by each of the administrators.

The 27 new teachers represented the following disciplines:*

Art	English	Social Studies & History	Sciences (Bio./Chem./Phys.)	Math
2	6	6	3	4

Psychology	Business Educ.	Guidance & Administration	Speech	Languages
1	1	3	1	1

* Note: A few of these teachers taught more than one subject; 2 were elementary school teachers from the Stone Elementary School, Melbourne, Florida, which joined the EV Program, Autumn 1965.

The 4 specialists working on the Syllabus were:

Mrs. Laura N. Young, Curriculum Specialist,
Melbourne High School, Melbourne, Florida

Mr. Ernest Papp, Teacher of Science,
Allentown School District, Allentown, Pennsylvania

Mr. Lloyd Welling, Teacher of English
Allderdice High School, Pittsburgh, Pennsylvania

Miss Pamie Rentrop, Teacher of Math,
Winchester High School, Winchester, Massachusetts

The research staff members of the EV Program for the Summer of 1966 were:

Mr. Bartlett H. Hayes, Jr., Director of the Education Through Vision Program

Mr. Gerald Shertzer, 2 and 3 Dimensional Design, Phillips Academy, Andover

Mr. Floyd Covert, Design, Massachusetts College of Art, Boston

Mr. Gene Pyle, Photography, Phillips Academy, Andover

In early 1966 the Educational Testing Service of Princeton, New Jersey, was requested to evaluate the EV Program as it is carried out in the various schools during the 1966-67 year. By June '66, they made an appraisal of the EV Program, leading to the analysis and tests to be applied during the next school year. Their initial appraisal was available for the teachers to study during the 1966 Summer Session.

AIMS OF THE 1966 SUMMER RESEARCH IN EV

The group working with Mrs. Young on the refinement of the Syllabus had 3 major points in mind:

1. The perfecting of the exercises individually
2. Questions as to the order of their presentation
3. The usefulness of the slide-tapes as introductions or conclusions to each of the exercises

The new teachers explored the course - as in previous Summers - following the order of the existing Syllabus. A series of 8 evening meetings were held with all the participants, veteran teachers on the Syllabus Committee as well as new teachers, to discuss the questions above as they applied to the explorations. Another and important function of these meetings was to extend the relevance of these exercises into the Sciences, History, and Mathematics fields with as much depth and variety as had already been accomplished in English. (see Addenda I).

Having covered chronologically and in some detail the progress of the 1965 EV Program (Section A), it would seem repetitive to cover the administration of the 1966 Course, which generally speaking, followed the same lines. Rather it would be significant here to investigate the 8 meetings with all the participant teachers, veteran teachers, and EV Staff members to see if they shed any new light on the exercises, the Syllabus, or the underlying concepts of the EV Program as a whole.

SUMMARIES OF EIGHT DISCUSSION MEETINGS HELD WITH ALL PARTICIPATING TEACHERS AND STAFF MEMBERS

June 30th:

B. Hayes stated the purposes of the 1966 Summer Research

1. To reinforce the Pilot Programs already underway
2. To revise the Syllabus and slide-tapes
3. To discover ways in which these exercises might have application - or relevance - to other disciplines, keeping as a goal increased awareness of the students

The Signature Problem was discussed first. B. Hayes raised several questions:

1. Is this a good exercise to break down barriers between disciplines?
2. Does it lead the student to feel that he can operate in the field of drawing - or can accomplish something that is new and difficult - showing him that he is capable of operating on a broader base than he thought was possible?
3. To what disciplines is this relevant?

Questions 1 and 2 were answered affirmatively by many with the conclusion that the student would become aware that he is capable of doing more than he thought he could; it would foster in the student the attitude that he could develop a potential unknown to himself. The Signature Problem was considered a good starting exercise because it would produce in the students an open attitude toward their studies. Several examples of the application of this exercise to other disciplines were given:

1. History
   - a. For a single event how many different interpretations are plausible?
   - b. Following a given event how many different possibilities are there in the way history could develop?
2. Science
   - a. Similarities to a scientific approach toward a problem were mentioned. The Signature Exercise encourages the student to search and look; rather than asking: "What is supposed to happen?" the student will ask himself: "What is happening or what will happen?"
   - b. There are often many ways of approaching the same problem; for example, harmonic motion, the concept of anti-matter in nucleonics, momentum and inertia, all could be introduced with parallels to this exercise
3. Mathematics

   The possibility was suggested of using this exercise as an opening exercise in teaching such topics as inverse operations or symmetric transformation.

The metaphoric values of this exercise in general education were discussed at length: that there are many ways of seeing other than habitual ways of looking; that there is no quick and easy recipe for real learning, just as there is no easy way to write your name upside down or backward.

The Color Change problem was discussed next and its metaphoric implications explored first:

1. In History an event may be examined in a particular context - or in various contexts. Would Lincoln be elected in 1960?
2. In Literature a word will change in context. Several uses of the word "cool" were given.
3. In Geography it was suggested that this exercise be used to introduce the concept of determinism: man changes according to his environment.
4. In Psychology this exercise might help the student identify himself against his social background. To what extent is a teenager influenced by a crowd?

It was pointed out that this exercise also would encourage the student to apply the scientific method, to use his own powers of observation - to understand that there is more than one correct way to find a solution; it would foster experimentation.

July 5th:

This was a discussion focused on the slide-tape as a medium. Its potential as a creative and individual means of expression was emphasized.

1. When making slide-tapes, the participants were urged by B. Hayes to see for themselves by taking their own slides rather than relying on the copy camera to supply them with secondhand material. By creative use of their own original slides the teachers - and later their students - could develop the concept: "What Do I See?" in a way unique to each of them.

2. After examining the possibilities of the slide-tape as a learning device, and planning the detailed organization of slide-tape production for the Summer, the teachers were urged to develop the medium as an expressive form.

July 7th:

G. Shertzer began this discussion by commenting on the meaning and influence of design in History. As an example he cited the use of the American Indian life symbol and described how the Nazis had converted the old swastika to their own ends.

The general question again concerned the relevancy of specific exercises to other disciplines: do they promote greater insight in areas of Science, Math, History?

One of the participants related the Curve-Straight Problem to History, suggesting that it could be used to show the beginning of a social movement; each succeeding line would show the effect of the preceding line and would be somewhat determined by the line that came before it. Any unusual stress or strain in history would certainly affect the lines or events that came later.

Another related the Spray Problem to Geography and Weather, saying that this was a good way to teach the fact that typography does influence weather. A member of the Syllabus Committee remarked that this same exercise was a clear way to visualize scale in aerial photography, although the staff member in charge of Photography pointed out that the greys in each case would have to be evaluated in their own contexts.

The exercise, Greys that "Curve" was discussed next. A new teacher asked what the purpose of this exercise was and another new teacher answered by saying that this particular problem had convinced him of the necessity of actually doing the problems. He could see, looking at the end results, that it worked, but by doing the exercise he learned how it worked visually. That it was an excellent way to see the various values involved in photography was pointed out and also that this exercise was a vivid way of learning how to transpose from black and white into values of any color. This led into a discussion of photograms, another exercise which was felt to be useful in transposing values.

Photograms were also considered metaphorically as showing that things appear to be what they are according to the point of view. The way light shines on the sensitive paper determines what the result will be. The light was then likened to an idea and to the way in which an idea becomes important in determining the result of that idea. The Mathematics member of the Syllabus Committee suggested that this would be a parallel to problems in projective geometry. The staff member in Photography made the practical suggestion that print-out paper exposed to sunlight would be a way of doing this problem that would eliminate the complications of a darkroom.

The Color Vibration Problem (involving the relationship of conflicting colors to one another) was related to History, the example given being that some vibrating force could destroy both an old and a new civilization to create something quite different from either.

The Color Transparency Problem was seen to have value in Mathematics to show the intersection of sets. An English teacher saw in this problem a useful parallel to teaching verbals (those words which have both the qualities of verbs and of other parts of speech).

All the color problems were considered highly motivational and the suggestion was made that more color problems be introduced into the Syllabus.

During this meeting some questions came up concerning the order and sequence of certain problems.

1. The suggestion was made that the exercise, Greys That "Curve", should precede the Color Change Problem.
2. There was discussion as to whether the slide-tape, COLOR, should precede or follow the exercises on color. No agreement was reached. There was also discussion - but no agreed conclusion - as to which should come first the Color Vibration or Color Transparency problem. Since there was no general consensus the opinion was given that perhaps it didn't matter.

July 12th:

B. Hayes opened this meeting with a discussion of the Syllabus and the exercises in it, stressing again the objective of finding more ways to relate the exercises to other disciplines. He asked the teachers for further definition of the exercises:

1. Are they ways of thinking in visual study?

2. Or are they experiments - in direct application?

With respect to the structure of the Syllabus, B. Hayes suggested that there was nothing sacrosanct about the order or sequence of the exercises. The Syllabus should be structured so as to define this course in EV, to be used only by teachers in this particular program. The structure should be determined by what the participants and staff want to do; It is up to the Educational Testing Service to measure what is done.

A few participants asked if teachers in particular disciplines chose from the course those units that best fitted their fields how then could ETS measure courses that are different? B. Hayes replied that the objective is bound to be the same; however, in answer to a question as to whether special courses in each of the various disciplines should now be evolved around the core of the EV problems, B. Hayes' answer was "no". The course will be of value if students curious about the exercises as they may extend into other disciplines are referred by the teacher presenting the EV course to the teachers of the fields in question. He suggested that next Summer separate courses might be designed for various fields.

B. Hayes continued that the immediate problem was to state explicitly just what this course in vision means and how the program can best be worked out. The exercises first should be considered as to their usefulness to the EV course and second, as they may be useful in their applications to other disciplines. The danger of applying these exercises too literally to other disciplines was realized. Some would fit; others should not be forced into applications that would seem contrived.

The English representative on the Syllabus Committee remarked that principally the course gives an inspiration for visual metaphor and for the visual language. It is valuable wherever sensory experience will explain or reinforce the verbal statement of experience. Implicit in the course is a new viewpoint. In his opinion the course should be required for all teachers as an in-service course; and then offered as training to all students.

Some practical problems the teachers had had with school administrators were raised - one of apathy - and another, the requirement of an exact accounting of how many days each of the problems might take if this time were going to be subtracted from the time allocated to English or History, etc. B. Hayes pointed out that this is not the time to get worried about college board requirements in such courses (English or History) - since the EV course is a separate course. This is the time to demonstrate that students in these fields can do better work as a result of their experience in EV. The most important thing to remember, B. Hayes said, is that the EV Course is still in the testing stage. The Syllabus is for the participants only. We should never pretend that we are doing anything but experimenting and we consider that our program is a Pilot Program. We think we have a good idea and it seems to be right, but we have no way to prove it yet.

The discussion then turned again to particular exercises, Figure Ground next. Metaphorically, the nature of this problem is the bringing together of opposites so that they give up their identities to create a third entity. Black and white are the opposites used in the Figure Ground problem. The consensus was that this exercise was essential to the course and one of the key problems; several of the participants felt that it could well be used as the first problem since it can evoke so many metaphors. Many specific examples were given of its use in English teaching: the contrast and balance of ideas in paragraph writing - or composition in general; in an understanding of the psychology of character in literature, this exercise parallels the constant interplay between a major event and a person's mind - or the impact of the event and how the person handles it. One teacher compared this exercise to the solving of any problem, what one does not do being as important as what one does do. The achievement of unity was seen as central to this problem but the variety of its achievement was wide in respect to size of units, number, or complexity.

July 15th:

The Colored Light Box exercise was the first one discussed at this meeting. It was a revelation to many of the participants that colors possessed 3 dimensional qualities: that colors could flatten space or create depth, in juxtaposition with other colors. This discussion not only led the participants into new ways of understanding color but into a broader consideration of ideas normally handled in psychology or philosophy, and finally into basic questions of what is reality and what is knowledge. Again questions were asked by the teachers about the necessity of following only the exercises given in the

Syllabus. It was suggested by a member of the Syllabus Committee that the Syllabus should provide the structure - or idea - and if that idea yields another point of view then the individual teacher should construct a problem to illuminate that point of view. He said that the studio exercises should be chosen with the view as to how basic these are to bigger concepts, as well as to the concept of perception itself. Perhaps the students later could be asked to develop some exercises of their own, to build another studio exercise, for instance, reaching toward another concept.

The Color Light Box problem also emphasized the importance of the frame of reference: if one looks in from the top, through the peephole, or with some of the slots blotted out, one does not see the same thing. An English teacher pointed out that a shift in meter functions with respect to poetic mood just as varying the colors in the Light Box manipulates one's perception of space.

The metaphoric relations of these exercises to other disciplines was discussed further and the comment made by one of the teachers that the EV Program would be most important to the Junior year high school students since it is in that year that many abstract transfers have to be made.

July 19th:

In the afternoon preceding the evening meeting all the participants displayed the textural studies they had completed for the purposes of evaluating them.

G. Shertzer pointed out that some were collages requiring verbal interpretations; visually they were not designs which explained themselves. The difficulty may have been in different interpretations of the problem: some simply put together a number of arbitrary materials; others tried to combine the different textures and create an organic whole. The results should make visual sense, G. Shertzer said; one cannot make literary translations of the problem. One should understand texture as a generating form in the struggle for organic design; however unrelated the objects combined are, if they are chosen for their visual qualities the end result must have visual unity.

Questioned about the point of this exercise, Floyd Covert answered: "To create a unity out of disparate parts." He continued that in doing this exercise there should by now be a carry over from the other problems done, the ability to create visual order out of the many things to be used, and the recognition of order when it is achieved.

A question about the reason for this problem was answered by B. Hayes, who said that we cannot look from one point of view only. There is no one solution.

The balance between an open ended approach and the desire on the part of some of the participants that each exercise have a clearly stated - and predetermined goal - was considered at some length. It was suggested that the problem should be explicit while the ways of working it out can be open ended. G. Shertzer pointed out that the means and the ends are the same thing: if the means are limited the ends are limited - how you arrive and how you end are the same.

An English teacher suggested that the success or failure of the result might not lie so much in how one worked as in one's having established a point of communication.

Several participants reiterated the idea that the end result came about because one had created. It would be a mistake to try to spell out too literal a purpose. The process of creation, work in organization, exploration (with the possibility of discovering the unexpected) all are important in these exercises. B. Hayes added that to achieve the kind of insight that lets you be your own critic is one of the main purposes of this particular exercise.

A History teacher commented on the unity of parts in this problem: "From a historical sense, what makes a civilization fall apart? It's a lack of unity."

A Science teacher remarked that in his view if the exercise were completed - and done sincerely - as a scientific experiment it would be successful.

Throughout this discussion there were those who wanted to "nail down" the purpose of this exercise. B. Hayes once more summarized by saying, "The purpose might lie in these questions: Can a student explore something to which he does not know the answer? Can he develop so that he can be his own critic? Can he convince himself that he can come up with an answer that is not in the book? The question underlying all these is how can we train students to face new situations, assuming that for each of them sometime something is going to come along where he does not know the answer."

One of the new participants, wondering if she had understood the Texture Collage problem properly the first time, rephrased it: "We were to find materials, work with the materials we found, make them into a whole to create something that was not like the pieces." Shertzer and Covert remarked that she was right.

Another of the new participants compared this exercise with a Rorschach Test in reverse, pointing up the way each of the finished exercises revealed something about the person who had made it.

A Science teacher saw in this exercise a chance to teach creatively, which is seldom planned for in the curriculum. There was discussion as to whether or not creativity can be "taught" which was summed up by the statement that it cannot be taught but that it certainly can be given a chance to develop. This, in turn, depends on the student's ability to visualize. The only way to see is to try.

July 21st:

In lieu of the usual evening meeting a special demonstration was given the evening of July 21st for all participants in the EV Program in the techniques of Synectics, a term originated by the firm of inventors and engineers who developed a system of invention whereby they have analyzed and evaluated problems and then designed a wide range of products and services as solutions.

The demonstration was carried out by some 12 members of a Phillips Academy Summer Session class in Studio Art, under the direction of A. Jacacci, who with other members of the P. A. Art Department, had taken part in 4 meetings with the Synectics staff in order to become familiar with their system.

The general objective for this group of students was to invent symbols for a visual language of about 30 words that would be universally understandable; at this particular meeting, a visual symbol for the word "question". Before the students embarked on their investigation (or "excursion" as it is defined in Synectics terms), Jacacci briefly summarized the Synectics process, saying that the usual technique is to seek analogies in areas other than the one under study which then lead to unexpected solutions. They have found that such working hypotheses are inevitably visual. The relevance of this system to the EV Program's approach was clear.

William J. J. Gordon, head of the Synectics firm, was present to answer questions, the first of which was how this process can fit into education. Mr. Gordon replied that recently the Synectics group had been asked to educate Peace Corps teachers. The central problem here had been the bridge between the Peace Corps and the people in other countries with whom they they were working. There could be bankruptcy in the program to educate underdeveloped countries if the Peace Corps teacher cut the student off from his own cultural metaphor or analogy. Today, in order to understand a strange world, it is the teacher's responsibility to teach a process by which the student may make his own hypothesis - or bridge. Mr. Gordon remarked that one of the dangers inherent in a teacher's employment of metaphors (using the techniques of Synectics) occurs if the teacher decides what answer he wants. He was asked if there might not be many "right" answers. Mr. Gordon replied that this depended on the field; in Art there can be many right answers; in the exact sciences, there are few. Mr. Gordon commented further on kinds of metaphors and their use in Art and the exact sciences. "Part of the spirit of Art," he said, "is stretching the familiar so that you can see the old as something new; in the exact sciences the problem is more trying to make the strange familiar." He discussed the use of analogues in solving problems, saying that at Synectics they had discovered a pattern that could almost be formalized: if the problem concerns an exact science - and has been around for a long time - it is best to search for a direct analogy in the organic universe; if it is a problem concerning people, then the final analogue should come from the exact sciences. He said that people's tendencies are to solve problems in terms of analogues that are too close. If the problem has been around for a long time someone would have found the close analogy. It was Mr. Gordon's feeling that both visual and verbal analogies are necessary in this process, that there is a productive oscillation between them; further that personal and symbolic analogies should be interlinked with visual metaphors.

Because of increased curiosity and interest in the process and achievements of Synectics on the part of the EV participants, a follow up meeting was held on the afternoon of July 28th, which was largely concerned with investigating the creative process. Robert Burden from Synectics remarked that their experience had confirmed an original hypothesis: that there is a latent creativity in people that is much higher than is commonly thought. He was asked whether at Synectics they were not too verbal in their search for a process for creativity. The answer was that the whole thing was a visual process, words were just a crude way to get the visualization across to somebody else.

"The creative input is visual or tactile, or verbal in a sense that is ultimately visual, and the words do dilute the image, but they bring the image up for communication, for examination, both for the sake of one's self and for others". In other words, Robert Burden said the whole process is probably visual perception and words are just a way to get from one image to another.

The conscious, the unconscious and the "pre-conscious" were all discussed in terms of the individual and his associations.

July 26th:

Beginning this meeting B. Hayes asked each of the participants to prepare in written form:

1. An evaluation of the summer's work
2. Answers to two questions about the presentation of the EV Program in their respective schools
    a. How would you like to see this Program in your school - ideally?
    b. How do you see it in practical terms?

He reminded all the participants that this is still a research program; that as an evolving program it should not be considered a course well tested. The discussion then continued with a consideration of the specific problems.

The Paper Bending Problem

1. Was seen as applicable to both Science and Mathematics
    a. Practical experience could be gained in the strengths of various materials

   b. A Mathematics teacher suggested the problem as an extension of basic constructions using compass and ruler: she felt it would make the student sensitive to structure wherever he found it
   c. B. Hayes remarked that a student may come back to one discipline with more interest because he has seen overtones in another
2. A teacher in English and Russian asked if there were not preliminary exercises which would facilitate getting used to the medium of paper before doing this problem: G. Shertzer acknowledged the technical difficulties of the problem but emphasized the point that the purpose of the problem was to discover by analogy what paper could do by having to make of it a 3 dimensional form. B. Hayes said: "Like assigning a topic in writing - the topic is not important but how it is worked with is." G. Shertzer said that to explore the material, to make it do something it does not want to do, is the basis of this exercise. Any material could be used: wire, plastic, etc.; wire does not lend itself to form, but it is a valuable exploration for the student to try to impose form upon it.
3. The metaphoric connotations of the problem were considered:
   a. An English teacher suggested the analogy that certain ideas lend themselves to certain forms just as some materials lend themselves to particular forms.
   b. A History teacher commented on the idea that imposing form is a revealing way to explore a subject, by saying that this could be applied symbolically through the

> idea of crisis and the strength of the thing or material in question. (Paper, for instance, develops a crisis point where the whole structure collapses.) In the same way the strength of a whole organization can break down - either through outside forces or for internal reasons.

A discussion followed of problems that were not in the Syllabus. A new teacher wanted to know about exercises not covered during the course this summer, requesting that they be described in the Syllabus. B. Hayes saw a constructive challenge in alerting people to other problems - some not in the Syllabus and others not even attempted in the summer exploration. He cited, as an example, diagrams of a ball point pen activated by a pendulum, and asked if such a problem could be included as a construction problem. Specific problems, he suggested, are most useful to illuminate basic areas of awareness.

The discussion then centered around problems that were considered valuable or those omitted that should be included in the Syllabus. Again it was urged (by a psychology teacher) that more color problems be added because of their value as transfer points into other disciplines.

The staff member in Photography suggested that there could be more tie-in between the art and the photography exercises. He suggested extending the straw and paper problems into photography, saying that these would make interesting photographic studies. There might also be a desirable tie-in photographically with the still life problems and other experiments with light. Some of the veteran teachers pointed out that the experiments made with light in previous summers had been exciting to the students.

The Vegetable Print exercise was raised next. A Psychology teacher remarked that he had found it the most valuable of all the exercises. There was a difference of opinion here - some felt that the problem lacked control and that sometimes nothing more came of it than wallpaper; others felt that its very flexibility made it possible to show different ways of looking at structure. It was considered a good problem in re-definition, similar to the approach of byonics. It was seen also as a problem leading into the whole area of printing, bas-relief sculpture and intaglio.

The Straw Exercise was then considered and the question raised whether this problem was too close to Paper Bending. Those participants in the field of Mathematics felt that this problem showed more than the Paper Bending exercise could in several areas: for instance, in Math problems that have to do with generating surfaces and planes, the visible evolution of an equation could be demonstrated by the Straw Problem in ways impossible with the Paper Bending exercise.

A participant from the field of Social Science stated that this problem defined an organic organization, illustrating how one could set up - or nature could set up - a system and keep within that system.

Two English teachers commented: one, that this exercise would be a clear way to teach the structure of poetry - a form has to be set up and the words, the lines, move within that form (some poems have a more formal approach than others, he said); another saw an analogy here on how to write a paragraph - if the straw - or the sentence doesn't contribute to the whole design, then it should be thrown out.

Another participant (from the Guidance field) commented that she had found the problem exciting because she had made a non-linear construction by means of linear elements.

G. Shertzer suggested that in setting up the Straw Problem strict limitations did need to be given: a description of the motions - or the system to be evolved (otherwise derivative structures like Eiffel Towers and bridges would be the result).

An English teacher summed up the evening's exploration by saying that it was exciting how History was influenced by such seemingly little things as materials or designs, and that new design, in its wish to overcome obstacles, created a search again for continuing design.

July 28th:

This meeting was focused on Action Painting, or as some called it, Visual improvisation. B. Hayes asked the participants to consider Action Painting from 2 Points of view: first, in connection with the Syllabus; and then from the standpoint of each Pilot Program. As the EV Program tightens up in the respective schools, B. Hayes suggested that the teachers ask themselves the following questions:

1. Should we seek better studies than those we have?
2. Should we cancel out any studies that we have now in the Syllabus?
3. Should these experiences occur in different order?

With respect to the Educational Testing Service evaluating the EV Program, B. Hayes mentioned a possible difficulty for them in the fact that there is no definite order or sequence. However, he felt that this was their challenge: how do you test something that is random?

B. Hayes next asked the participants to consider the Action Painting exercise. He asked the question: "Does Action Painting first tend to have people overlook the need for structure?" It was agreed that this exercise did engender a freer approach, and that it certainly produced a more experimental attitude toward the Vegetable Print exercise following it. This led into another discussion of the Vegetable Print along with several afterthoughts that had come to the participants since their first discussion. One remarked that the end result of this exercise was certainly to increase the imaginative quality of the student. He felt that there was much to be learned from what other people were doing and was interested in the variety of ways in which people looked at a specific object such as a carrot or an onion. He thought this might be a way to document the directions of people's thoughts.

A Math teacher commented: "I felt the Vetetable Print was great. It was the first thing I had been willing to do unintellectually. The Action Painting coming first helped release my feelings so I could do a good job on the Vegetable Print." Another wished that the Action Painting had come before the Texture Problem so she would have been less inhibited.

At this point a lengthy debate on the Action Painting exercise was carried on by many of the participating teachers and staff members.

F. Covert, a staff member, touched it off by stating: "ETS (the Educational Testing Service) will have trouble testing Action Painting." He then asked several key questions:

1. "How would you rate it?"
2. "Is it learning?"
3. "Is it all play?"
4. "Something does happen - what is it? Should it?"

B. Hayes then asked:

1. "Does the exercise belong earlier?"
2. "Can it happen too early?"

The responses to these questions did not follow immediately - or in order - but it may be more revealing to trace them as they came up, as in a sense - like peeling an onion - the more conclusive answers took longer to formulate and developed through the course of the debate.

An immediate reaction to the exercise (from a veteran teacher in the field of Science) mentioned a release of frustrations: "We come into the arena as gladiators. We attack the paper with paint and brush and hand and foot". It is significant to note that later on the same teacher remarked: "I had a great experience with Action Painting, Visual Improvisation. I could never understand how an artist could get feeling, so I began as a pendulum would begin and the colors blended as they came from my brush. If you have an idea you can see where you may be going. However, here I achieved something I wanted to do and I did it accidentally."

After the point was made that doing the Action Painting first produced richer results in the Vegetable Print exercise, later, one of the new participants remarked that the Action Painting exercise should come earlier if a year - or half a year - is planned for the Program. G. Shertzer said: "Maybe there should be a before and after Action Painting - one early and one later, like a test and a re-test."

A new participant (whose field was Psychology) asked: "What does the problem do? It's great for therapeutic value but in what way does it follow the progression of problems in the Syllabus?"

A new teacher (of English and Russian) answered: "I don't know whether it follows any progression or not, but with the Action Painting, suddenly I discovered that I liked colors. I didn't know before that I liked colors. I really never thought about it before."

Another new teacher (Math) said: "I think it's fine for motivation; it's so much fun."

An English teacher - also new - picked it up from here: "It was great fun. It was a freeing experience. It made me appreciate more abstract, modern painting. It made me realize how very difficult it is to throw paint in an organized fashion. The freedom that one felt here is analagous to freedom in writing."

B. Hayes said: "Freedom to paint and freedom to write are analagous. This exercise could be useful to English teachers to show how words might be used as a starter in writing."

The new teacher who suggested that this problem should come earlier in the EV Course, at this juncture said that simply having the students do the problem and letting it go at that was not enough. The greatest benefit from the problem could be derived if the students did the exercise and then shortly afterward discussed their feelings about it and the values of the exercise. Another new teacher (Math) objected on the basis that this exercise, in her opinion, was a highly personal experience which one should not be asked to pin down in an evaluation of its purpose.

The new teacher who had remarked earlier on the therapeutic value of the exercise but could not see any other purpose to it, again queried the goal of Action Painting. Was it simply to lose the inhibitions that destroy creativity, he wondered? Before being given an answer, he was asked 2 questions: Did he think what happened was disgusting or creative? Was it wasteful or productive? He did not answer these questions but said that he still could not see any tie-in with the Program.

Some discussion took place between the participants as to whether in one day it was possible to release years of inhibitions or whether, in fact, one was ever completely uninhibited. It would seem that the answer was a question of relativity.

A veteran teacher (from the area of Administration) made an evaluation of his reactions to this exercise the first time he did it (Summer 1965) and the second time (Summer 1966): "Last year I felt we were just crazy kooks. But today I think we should put this exercise nearer the beginning, just do the problem, and then hold the end result for looking at later and comparing with a later Action Painting. "This time,"he continued, "I experimented with the paint to see what it would do. I tried to make the familiar look strange. I like to look at the total output of the class ..... I would ask myself, I wonder who did that? I would try to equate the picture with the personality. My guess as to who the artist was was usually right." He concluded: "I would like to think about comparing the value of an Action Painting done when the student had no previous experience in the course with the Action Painting completed after the course had been on its way."

Two participants enjoyed the creative fulfillment of this problem and thought this was sufficient end in itself (one, who had done it the year before, said that the first time in 1965, she had felt it was a waste of paint, but this time, being less inhibited, she was more interested.)

The teacher who was dubious about the purpose of Action Painting - other than therapeutic - was still not convinced. "I enjoyed it," he said, "but after the problem is interpreted in terms of releasing hostile feelings - or after others have said that they loved it - the approach either way was emotional; the results were uncontrollable. I loved it but what was the point? Doing and enjoying just for the sake of doing and enjoying?"

A veteran teacher answered: "It was a great problem; it brought together many principles. It was a kind of summation of problems: one had to see color (Sally, for example, discovered it for the first time); the interplay necessary in Figure - Ground was needed. In a way it was uncontrollable, but many deliberate choices had to be made. There were technical problems - for example, I had to find out how to make a line. I had to invent and seek for a solution. It is as in an English composition - one eventually has to tackle it intellectually. Action

Painting, I feel, gets one totally involved: the kinesthetic interplay, intuition, intellectualization, emotion - all play a part."

G. Shertzer said: "In paper folding there is the same use of freedom to be considered."

"But," the doubter continued, "just what is the purpose? If this thing just stops with doing and with emotional release, what of it? Is the purpose to find out something?"

B. Hayes answered: "There is an element of control here. We could repeat the exercise for control value, perhaps in an experiment like this: suppose we get 4 huge sheets of paper - 9' x 12', carpet size; then we divide the class into groups of 4 so that each group has one huge sheet of paper. Now, we will have each group play with its own sheet of paper as in a game of checkers; that is, there will be alternate moves. Let's say the first student splatters paint on the sheet of paper; the second may also splatter paint, but he will have to do it in terms of what the first has done; the third, aware of what the first two have done, will give his splatter of paint; and so on, until all in the group have splattered paint on the paper. Then the 4 sheets may be displayed, and in a competitive mood, it can be decided which of the 4 designs has the most interest - and why.

"Here is a problem, then, that will show accident plus control; the elements of discovery, reconciliation to an act of environment, or of an act to environment - all are here. The formula seems to be: accident plus individuality plus teamwork plus what has been done before - what do you have?"

"If we are going to teach EV this way," an English teacher asked, "what kinds of questions do we ask our high school students after they have finished this exercise?" B. Hayes suggested the following:

> "What have you learned about yourself?"
>
> "Can you realize what it means to be tight, inhibited?"
>
> "Do you know the difference in acting when you have freedom and when you have control?"
>
> "How far can you go in complete freedom? When do you have to close in?"
>
> "It might then be possible," B. Hayes added, "to have the History or Art teacher come in and talk to the students in terms of their particular disciplines."

A veteran teacher, evaluating Action Painting, contributed a possible new name - or title - for the exercise. "I would like to think of this as visual improvisation: we use improvisation verbally in the theatre; the musician uses notes for musical improvisation. I think of this exercise as "visual improvisation". In a way it's like life which itself is a kind of improvisation. You put yourself into life and maybe you have no control at times, but you have to handle the results of what has been done before." G. Shertzer asked this teacher if, in verbal improvisation, a scene were given? The answer was no - that often a single line or word was enough. B. Hayes suggested that we might make a visual improvisation beginning with a single color.

Applying this idea to the improvising of equipment in a Science class, a teacher remarked that sometimes when all the data - or materials - are gathered together, the total collection appears to be confused;

but, he pointed out, it is from all this data that many hypotheses may come.

Verbal improvisation was further defined as putting order into disorder, forcing the individual to express himself in his own terms - not in clichés. The point was made that this definition could be applied to all the new material now available for teachers ; until the teachers learn to control or put it in order, it may indeed be confused.

A veteran teacher (Math) said that as a result of this course she had discovered that she could learn in 3 different ways:

1. She learned something within herself
2. She learned about "seeing" from working with the group
3. She learned through these discussions about the problems

A new teacher - also in Math - remarked: "I have a feeling that there is intended repetition of implied purpose in this course. It seems as if each problem reaches out to achieve the same thing and that is the idea of order out of disorder. This seemed the thing we got at in Action Painting, in the Texture Problem, in the Straw Problem - and in most of the exercises we have done. Is this finding order out of disorder the general purpose of the whole course?"

B. Hayes answered that to discern structure and order in the effort to understand is inevitable. A veteran teacher answered that he felt that one of the most important values of this course was breaking down the artificial barrier between life and school, and that there are many ways one can answer the question: "What does it mean?" Things do not always have to have a didactic value. A tree does not mean something -

it is valid in itself. An Action Painting is valid in itself.

B. Hayes ended this meeting by saying that these discussions were the best evaluations of the course. From a general consensus we are challenged to debate, to think of something we had not thought of before. Articulation will be just as important in the classroom with the students. All of these problems are useful if formulated, along with the the ideas and experiences which accompany them.

— OBJECTIVES ACHIEVED, 1966 —

As had been planned, the committee of 4 who were assigned the task of analyzing and redefining the Syllabus applied itself to this end throughout the five week session. The Syllabus was studied from the point of view of their own specialties as well as in consultation with the other participants during the group meetings, as reported in the pages preceding.

Eight sets of 10 slide-tapes each, comprising a total of 6,000 slides, were copied and supplied to those schools which had not yet obtained the material to work with.

Pilot programs are projected for 15 schools to be evaluated during the school year, 1966-67 by the Educational Testing Service, Princeton, with a report from the latter (operating under a grant from the U. S. Office of Education) expected in July 1967.

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

Participating Teachers: Summer 1965

SCHOOL	REPRESENTATIVE	SUBJECT
Abbot Academy School Street Andover, Massachusetts	Kuzminski, Sylvia M.	Math
	Powel, Virginia (Mrs.)	Art
	St. Pierre, Jean M.	English
Allentown School District 31 South Penn Street Allentown, Pennsylvania	Horst, Jacob M.	English
	Klova, Robert P.	Social Studies
	Lichner, Robert W.	Art
	Papp, Ernest	Science
English High School 77 Avenue Louis Pasteur Boston, Massachusetts	Denninger, Charles P.	Art
	Heins, Paul	English
	Mullan, James F.	Biology/Chemistry
Dorchester High School 76 Dunbar Avenue Boston, Massachusetts	Tulysewski, Michael	Art
	Whittaker, Grace	English
Melbourne High School 1050 Babcock Street Melbourne, Florida	Coffin, Margaret	English
	Cooper, Miriam	English
	Lutterbie, Patricia (Mrs.)	English
	Young, Laura (Mrs.)	English
Memphis Technical High School 1266 Poplar Avenue Memphis, Tennessee	Bourne, William A.	Principal
	McHaffie, Lois (Mrs.)	Guidance
	Piaggio, George	Art
	Ulmer, Mary	English
Milford High School West Street Milford, New Hampshire	Bryson, Esther J.	Library
	Childs, William	Art
	Clarke, Helen (Mrs.)	English
Newton Public Schools Newton South High School 140 Brandeis Newton Centre, Massachusetts	Eaton, Abigail C.	Science
	Roberts, George O.	Art
Newton High School 453 Walnut Street Newtonville, Massachusetts	Schultz, Lloyd F.	Art
North Reading High School Park Street North Reading, Massachusetts	Hughes, Francis	Art
	Keyes, Frederick A.	English
	McClory, Charles B.	History
Pittsburgh, Pa., Public Schools Allderdice High School 2409 Shady Avenue	Welling, Lloyd C.	English
	Wuchnich, D'Anne	English
Langley High School Sheraben Boulevard	Bailey, Carol A.	English
	Bridgewater, Mavis	Art

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

Participating Teachers: Summer 1965

SCHOOL	REPRESENTATIVE	SUBJECT
South Boston High School 95 G Street Boston, Massachusetts	Botelho, Jeremiah J.	Spanish
Winchester High School 458 Main Street Winchester, Massachusetts	Morse, Thomas A. Rentrop, Pamie Rosenthal, Macey S.	Administration Math Psychology
Worcester Public Schools North High School 46 Salisbury Street Worcester, Massachusetts	Duffy, Robert	Art

---

Participating Teachers: Summer 1966

SCHOOL	REPRESENTATIVE	SUBJECT
Abbot Academy School Street Andover, Massachusetts	Ceely, Jonatha (Mrs.) Vickers, Barbara (Mrs.)	English Math
Allentown High School Allentown, Pennsylvania	Klova, Robert P. Papp, Ernest* Gower, Joseph	Social Studies Science History
Dorchester High School 76 Dunbar Avenue Boston, Massachusetts	Brook, Fredda K. (Mrs.) Weidner, Walter H.	Social Studies Business Education
English High School 77 Avenue Louis Pasteur Boston, Massachusetts	Mosher, Edwin J.P., Jr. Mullan, James F.	History Biology/Chemistry
Melbourne High School 1050 Babcock Street Melbourne, Florida	Bauer, Virginia A. Evelyn, David G. Young, Laura N. (Mrs.)*	Math Art Curriculum Specialist
Memphis Technical High School 1266 Poplar Avenue Memphis, Tennessee	Butts, Ruth McHaffie, Lois	Speech Guidance
Milford High School West Street Milford, New Hampshire	Byrne, Sarah F. (Mrs.) Kelly, Francis A.	English/Russian Math

RESEARCH PROGRAM IN EDUCATION THROUGH VISION

Participating Teachers: Summer 1966

SCHOOL	REPRESENTATIVE	SUBJECT
Newton South High School 430 Walnut Street Newton, Massachusetts	Busselle, Samuel M.	Art/Social Studies
	Smith, Frances M.	English
North Reading High School Park Street North Reading, Massachusetts	Cleary, David G.	History
	Keyes, Frederick A.	English
Pittsburgh High Schools		
Allderdice High School 2409 Shady Avenue	Berger, Susan	English
	Welling, Lloyd*	English
Langley High School Sheraben Boulevard	Butz, John D.	Biology
	Schaffer, Harry F.	English
Stone School (Elementary) 32901 Shull Street Melbourne, Florida	Harris, Leferre	Elementary
	Johnson, Edna E. (Mrs.)	Elementary
Winchester High School 458 Main Street Winchester, Massachusetts	Morse, Thomas A.	Administration
	Rentrop, Pamie E.*	Math
	Rosenthal, Macey S.	Psychology
North High School 46 Salisbury Street Worcester, Massachusetts	Hamelin, Joseph A.	Physics
	O'Brien, Thomas	Math

* Specialists on Syllabus Committee